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Cover: Detail of the Alexander Mosaic showing the Persian king Darius III
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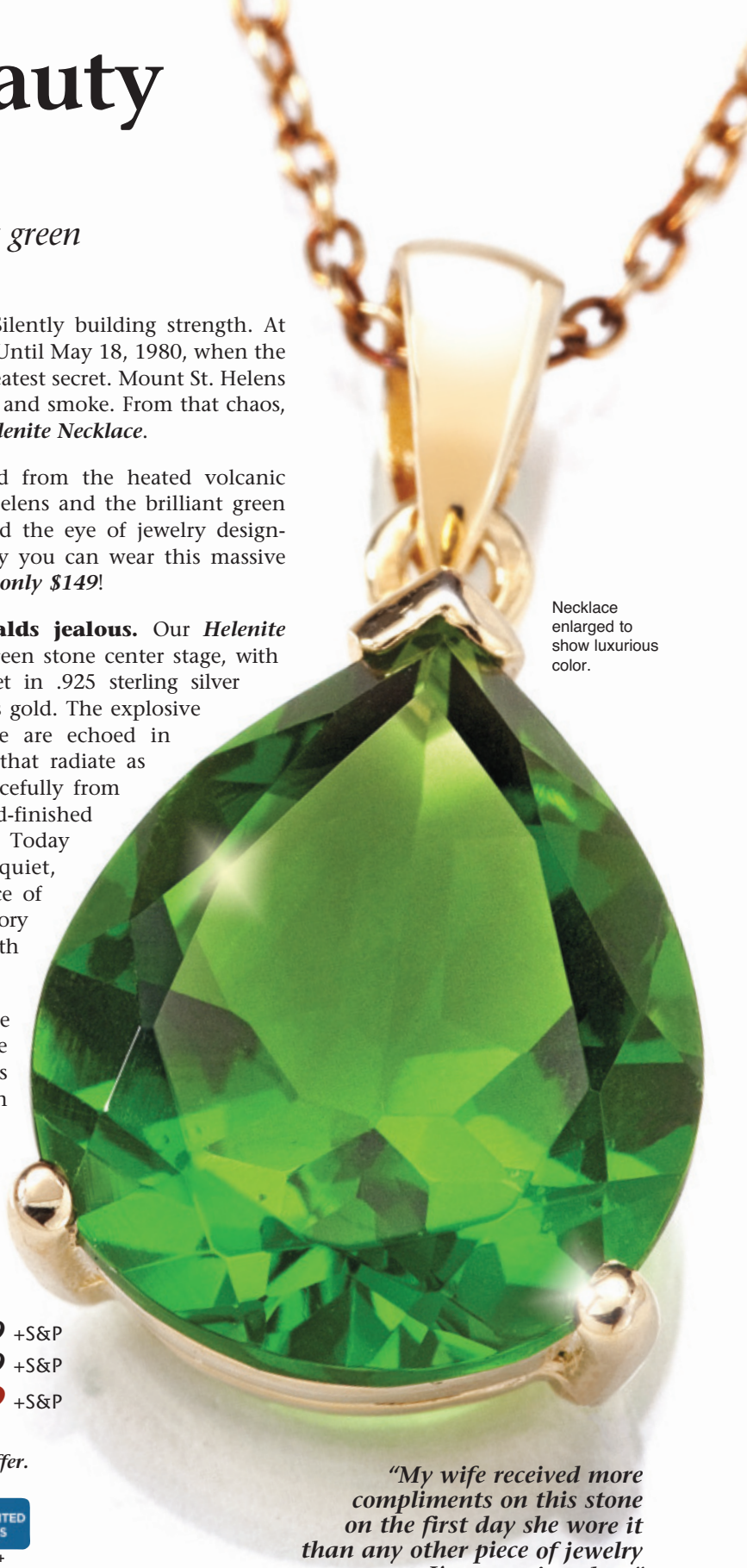

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BY SARA TOTH STUB

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EDITOR'S LETTER

VOICES FROM THE PAST

The words and thoughts expressed by individuals from past cultures do not always survive to our time. In many cases, the objects and monuments these people created have endured, but we have no evidence of what they thought about their creations, or even what they might have called the things they used or saw every day.

Some people, like those of the Trypillia Culture of Eastern Europe, who you will read about in "Megasites of Ukraine" by Berlin-based journalist Megan Gannon, were preliterate, while others, like the ancestors of today's Shoshone featured in "Villages in the Sky" by writer and photographer Matt Stirn, passed along their traditions using oral rather than written means. Regardless of the medium, in this issue, you will encounter a truly impressive array of voices from the past that illuminate the thoughts, myths, beliefs, and desires of individual people who lived thousands of years ago—from regular citizens to the world's most powerful kings.

The first ancient words you will read about were penned by the Greek travel writer Pausanias, who, upon his visit to Athens in the second century A.D., wrote about seeing a particular collection of ancient Athenian trophies stored on the Acropolis. As contributing editor Jason Urbanus tells us in "The Parthenon by Any Other Name?" these words may support a scholar's radical proposal that one of the ancient world's most famous buildings has been misidentified for more than 2,000 years. Elsewhere in Digs & Discoveries, you will read the curses of some very angry ancient Athenians and their demand for retribution against those who have wronged them.

You'll hear not just from these ordinary citizens, but also from the great Assyrian king Sennacherib in "The King's Canal" by senior editor Daniel Weiss. Sennacherib commissioned inscriptions to be carved into a cliff above a set of impressive waterworks he built to irrigate the fields tended by his subjects. These serve as a not-so-subtle reminder of his largesse and express his determination to keep his vast empire in line.

Other interesting voices from the past you will hear are those of the medieval Arab geographers quoted in "Letter from Morocco: Splendor at the Edge of the Sahara" by Jerusalem-based writer Sara Toth Stub. These travelers' words are rare firsthand accounts and impressions of their journeys across the Islamic world in the Middle Ages.

And finally, one of the most powerful voices in this issue belongs to former slave Elijah Marrs from my own "A Path to Freedom." In a way that can only be conveyed through someone's own deeply personal words, Marrs, who enlisted in the Union Army during the Civil War, eloquently expresses what it meant to finally achieve the freedom he had been denied for so long.

Jarrett A. Lobell
Editor in Chief

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FROM THE PRESIDENT

BUILDING COMMUNITY

Engaging the public, one of an archaeologist's most rewarding jobs, can take many forms. Many of ARCHAEOLOGY's readers are aware of the Archaeological Institute of America's public lecture program, but perhaps fewer know about the Institute's Site Preservation Program. The United States Committee of the International Council on Monuments and Sites has singled out the Site Preservation Program as one of the most innovative models in heritage management. For more on this program and to read about the Pyramids and Necropolis of Nuri Project in Sudan, a recent awardee, go to archaeological.org/sitepreservation.

Jordanian and Syrian refugee children learn about pottery in a program at Umm el-Jimal.

In addition to their work to preserve sites, archaeologists spend a great deal of time and effort on public engagement and community building in the areas where they excavate. The people most affected by archaeological work, be they abroad or here at home, understandably want to have a voice in the process, from research design to interpretation. Local pride plays a huge role in protecting sites, and education is critical.

Here are a few examples of community building from around the world:

In the Malloura Valley of Cyprus, the Athienou Archaeological Project involves the small town of Athienou, located in the United Nations buffer zone between the Turkish-controlled area and the Republic of Cyprus. Archaeological discoveries there have generated great civic pride. Shared ownership in the project's success is visible in the new municipal town hall, which boasts an archaeology lab, a storage facility, and a museum for archaeological finds from the region, in addition to town offices and conference spaces.

In Quintana Roo, Mexico, the Tihosuco Heritage Project is exploring diverse aspects of local cultural patrimony and evolving Maya identity. Tihosuco is where the Caste War started in 1847. This was the longest and most successful indigenous rebellion in Latin American history, and its imprint defines both the region and the town. One of the project's many parts involves developing bilingual curricula in both Spanish and Mayan. Language shift from Mayan to Spanish is becoming common among the community's young people, and their preference for Spanish puts at risk many elements of traditional Maya culture and identity. This element of the project recognizes and reinforces language practices at the Caste War Museum, tries to reduce the stigma of speaking Mayan, and helps increase Mayan literacy among school-age children.

And, in Umm el-Jimal, Jordan, an archaeological partnership between the Department of Antiquities and the Ministry of Tourism of Jordan has created an Interpretive and Hospitality Center for cultural heritage programs, community-based tour guiding, cultural and archaeological heritage curricula, and educational programs for use in schools, on site, and with adult community groups.

Laetitia La Follette
President, Archaeological Institute of America

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Some of the earliest Maya murals were discovered at San Bartolo, Guatemala. (Photo courtesy Heather Hurst)

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Eric Blind, Presidio Trust archaeologist, with Ellen and Charles S. La Follette in the archaeology lab at The William Penn Mott, Jr. Presidio Visitor Center, San Francisco, CA.

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FROM OUR READERS

TO THE EDITOR

As a member of the international consortium involved in protecting, preserving, documenting, excavating, and publishing the amazing painted tomb discovered in Bayt Ras, Jordan, in 2016, I was pleased to have some information about the tomb and images from its walls presented to the readership of the magazine ("The Founder's Tomb," March/April 2020). However, we wish that those responsible for the ongoing work in the tomb had received proper acknowledgment in the article. Due to the nature of this site and its fragility, the tomb's management has been especially complicated, and has required a concerted effort on behalf of international partners and experts. As such, we believe that the consortium that forms the Bayt Ras Tomb Project is worthy of mention. We believe that including the project name and its consortium members in the fine print photo credits on page 61 is an insufficient way to credit the institutions whose researchers are involved in the project.

The consortium is comprised of the USAID Sustainable Cultural Heritage Through Engagement of Local Communities Project (SCHEP), Istituto Superiore per la Conservazione ed il Restauro, Department of Antiquities of Jordan, French Institute for the Near East, and French National Center for Scientific Research. Likewise, USAID SCHEP (usaidschep.org) is implemented by ACOR, the American Center of Oriental Research in Amman, which has also contributed a great deal to the Bayt Ras Project and should be added to the institutions involved. Finally, the Bayt Ras Project is led by two Jordanian experts, Jehad Haroun of SCHEP and Ahmed Lash of the Department of Antiquities, and it was a great disappointment to us to see a lack of recognition of the important contributions of Jordanian scholars to the research reflected in the article. As a member of the Bayt Ras Project technical committee, I wanted to ensure that the efforts of many over the past three years be given due prominence.

Nizar Al Adarbeh
Chief of Party
USAID SCHEP

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TESTING THE PAST

I very much enjoyed Samir S. Patel's "Atomic Age Ghost Fleet," (March/April 2020). Patel certainly made the destructive horror of nuclear weapons and what their impact would be over populated areas crystal clear. He mentioned that the original residents of Bikini Atoll were forcibly removed from their residences right after World War II. I would like to know what happened to them. After Hiroshima and Nagasaki, they were the next victims of our nuclear weapons program.

Payson Sheets
Boulder, CO

Samir S. Patel responds:
The plight of the native Bikinians was very much on our mind as we were writing the story. Several thousand Bikinian descendants now live primarily in Majuro. Small-scale attempts at resettlement were made but aborted. Though the general radiation dose from being in the archipelago is not particularly high, the food grown there remains problematic. A few Bikinian caretakers remain there as part of a DOE research program.

In 1948 I was a midshipman on the battleship *Iowa* for a training cruise in the Pacific. The battleship *Nevada*, the target ship of the bomb test Able ("Atomic Age Ghost Fleet," March/April 2020) was anchored in Pearl Harbor well away from everything else. One side was blackened and very damaged. The other side was still covered with its original target red paint. It was too radioactive to salvage or for anyone to get on board to scuttle. As part of our training, *Nevada* was towed out to sea to be sunk as target practice. After she sank, *Iowa* cruised slowly above, while *Nevada*'s battle record was announced over the PA system, an old Navy custom.

Richard L. Cook
Sherman Oaks, CA

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THE PARTHENON BY ANY OTHER NAME?

Parthenon, Athens, Greece

The Parthenon on the Athenian Acropolis is one of the best-known buildings of the ancient world. Yet, despite its renown, it turns out that for more than 2,000 years, we may have been calling the temple by the wrong name. "I knew that scholars didn't really understand why it's called the Parthenon," says Utrecht University archaeologist Janric van Rookhuijzen, "so I started looking into a giant puzzle of ancient texts, inscriptions, and archaeological remains." His surprising, perhaps even heretical, theory suggests that "Parthenon" may not have originally referred to the structure we know today—which is sometimes called the Great Temple of Athena—but to part of an altogether different temple on the Acropolis.

For van Rookhuijzen, the crux of the issue lies in the meaning of the Greek word *parthenon*—"a room for virgins or unwed maidens." The first use of this term in reference to a building on the Acropolis appears in inscriptions dating to 434 B.C. At the time, the temples of the Acropolis were not only religious sanctuaries, but also served as banks and trophy rooms where gold and silver, jewelry, precious artifacts, and spoils of war were stored. Athenian officials took detailed annual inventories of these treasures, noting exactly where each was kept. They listed locations including the *opisthodomos*, "back room," *proneos*, "front porch," *hekatompedos*, "100-foot-long room," and *parthenon*.

Although modern scholars have not always agreed on the location and identification of each of these rooms, almost all have assumed that "parthenon" must refer to the building we know as the Parthenon today, an association that van Rookhuijzen finds problematic. It has long been assumed that the Great Temple of Athena derived its nickname, the Parthenon, from the immense chryselephantine, or gold and ivory, statue of Athena Parthenos, or "Virgin Athena," that once stood in the building's large eastern cella. But van Rookhuijzen has found there is actually very little evidence to support this explanation for the structure's name, and that there are no strong indications that the Great Temple of Athena was frequently occupied or used by maidens, virgins, or priestesses.

There is, however, according to van Rookhuijzen, another building on the Acropolis, not far from the Great Temple of Athena, that better suits the definition of a parthenon. This is the enigmatic sacred complex known conventionally, but, says van Rookhuijzen, probably erroneously, as the Erechtheion. It includes six larger-than-life-size sculpted female figures called caryatids, thought to represent mythological maidens (*parthenoi*), that serve as the columns supporting the porch's roof. Archaeological evidence has shown that the Erechtheion was also once amply decorated with a

number of carved female figures. In this sacred space, young virgin priestesses performed religious rites, and some may have even lived there. "In the true sense of the word, this part of the building was a real 'parthenon,'" says van Rookhuijzen.

The Acropolis treasure inventories from the fifth and fourth centuries B.C. document specific objects that were stored in the parthenon, including pieces of furniture and armor seized from the Persians after they were defeated in the 479 B.C. Battle of Plataea. Many hundreds of years later, the second-century A.D. writer and traveler Pausanias visited Athens and seems to have described seeing the very same objects that had centuries earlier been inventoried as "in the Parthenon," not in the building we call the Parthenon today, but in the caryatid building. "It's unlikely that the treasures were moved from one place to another," says van Rookhuijzen. "Therefore, the parthenon should be known as part of the caryatid temple."

Erechtheion, Athens, Greece

Van Rookhuijzen understands that not everyone will agree with his hypothesis, but is pleased to have sparked renewed discussions about the topography of the Athenian Acropolis. "The Parthenon means so much to so many people, both in Greece and in the rest of the world," he says. "I don't see it as my task to dictate what others should believe, but rather to offer material for contemplation and discussion, and to invite others to investigate the roots of our knowledge of this complex, fascinating site."

—Jason Urbanus

OFF THE GRID OPPIDO MAMERTINA, ITALY

Roughly 1,000 feet above sea level in the hilly interior of Calabria—the toe of Italy's boot—the town of Oppido Mamertina is surrounded by ancient forested terrain. The modern town is the successor to a medieval town called Oppido Vecchio that was destroyed by an earthquake in 1783, and whose evocative ruins still stand for visitors to admire. These include town gates and streets, and cloisters built by religious orders. There is also a castle, dating to the eleventh-century Norman conquest of southern Italy, which was periodically renovated according to the shifting fashions of the times until the seventeenth century.

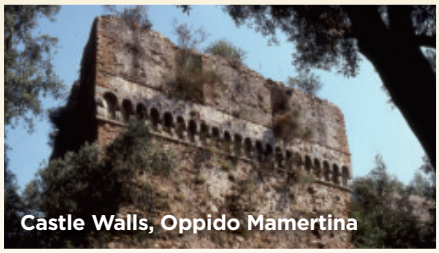
Archaeologists have discovered that the area was home to Iron Age settlements dating back far earlier, to at least the seventh century B.C. In the late fourth century B.C, Oscan-speaking Italic peoples indigenous to southern Italy moved into the area, which, at the time, was controlled by the coastal Greek colony of Locri, some 15 miles away. One such group, the Tauriani, built a large town at the site of Contrada Mella, a short walk downhill from Oppido Vecchio. "The Tauriani do not appear to have fought against the nearby Greeks," says archaeologist Paolo Visonà of the University of Kentucky. "They somehow established themselves in the region and developed a multifaceted relationship with their Greek neighbors. In fact, I think they constructed a unique identity out of their entanglement with both Greek and local Italic communities." Examples of Greek influence found at Contrada Mella include aspects of town planning, masonry styles, a wealth of Greek coins, and decorative imagery inspired by Greek theater. Visonà believes it is possible the Tauriani came to the area as mercenaries hired to defend Locri's interests against both Greek and indigenous rivals. After initially supporting the Carthaginian general Hannibal, the Tauriani formed a judicious alliance with the Roman Republic during the Second Punic War (218–201 B.C.). Possibly through the largesse of the victorious Romans, they subsequently expanded Contrada Mella.

THE SITE

Begin your trip with a visit to the archaeology museum in the city of Reggio Calabria for a primer on local history and Tauriani culture. After a drive of an hour or so northeast to Oppido Mamertina, signs in the main square provide directions to Oppido Vecchio, and an interpretive display offers guidance for a self-directed tour. While Contrada Mella is mostly overgrown, the site can be seen by looking downhill from the medieval ruins.

WHILE YOU'RE THERE

To fully appreciate the mélange of cultures in Calabria more than 2,000 years ago, continue east from Oppido Mamertina to the coast and visit the archaeological park of ancient Locri, where, in addition to several excellent seaside restaurants, you will find the remains of a once-grand theater and Ionic temple. Be sure to visit cdc.gov/travel for updates on health risks in the area.


Castle Walls, Oppido Mamertina

—Marley Brown

GUARDIAN FELINE

For more than 1,000 years, Egyptians buried their dead at the Aswan necropolis, on the banks of the Nile. In one tomb, which contained as many as 30 bodies, a joint Italian-Egyptian team recently noticed a painted leopard's face peering at them from the soil. The painting, which may once have decorated the lid of a sarcophagus, is in an extremely delicate state of preservation, making it difficult to remove. Now the researchers have digitally reconstructed the face of the painted feline, which accompanied one ancient Egyptian's journey to the afterlife around 2,100 years ago. "We understood that the very fragile piece of wood could be restored and returned back to its original splendor," says University of Milan archaeologist Patrizia Piacentini. "For the moment, the restoration is only virtual, but we hope to get the same results with an actual restoration."

Painted leopard in situ, Aswan, Egypt

Virtual reconstruction

In ancient Egypt, the leopard was a symbol of power and strength. Egyptologists believe the painted animal's face would have been positioned directly above the deceased's head to provide guidance and protection in the afterlife.

—Jason Urbanus

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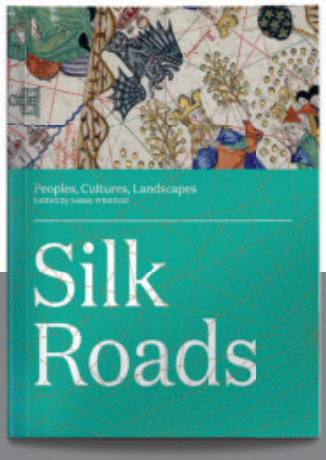

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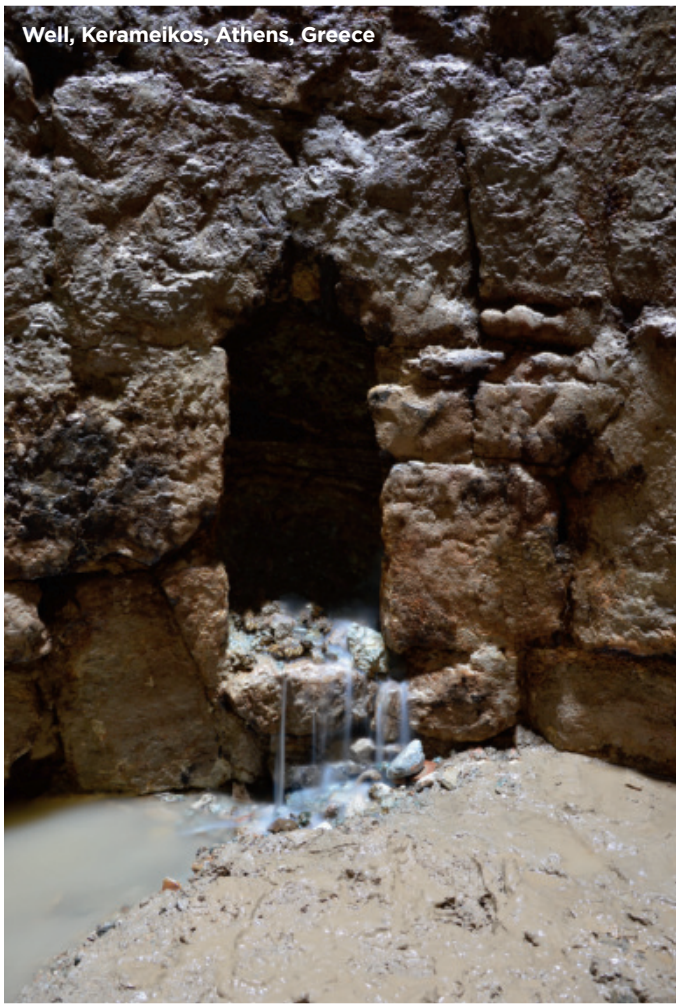
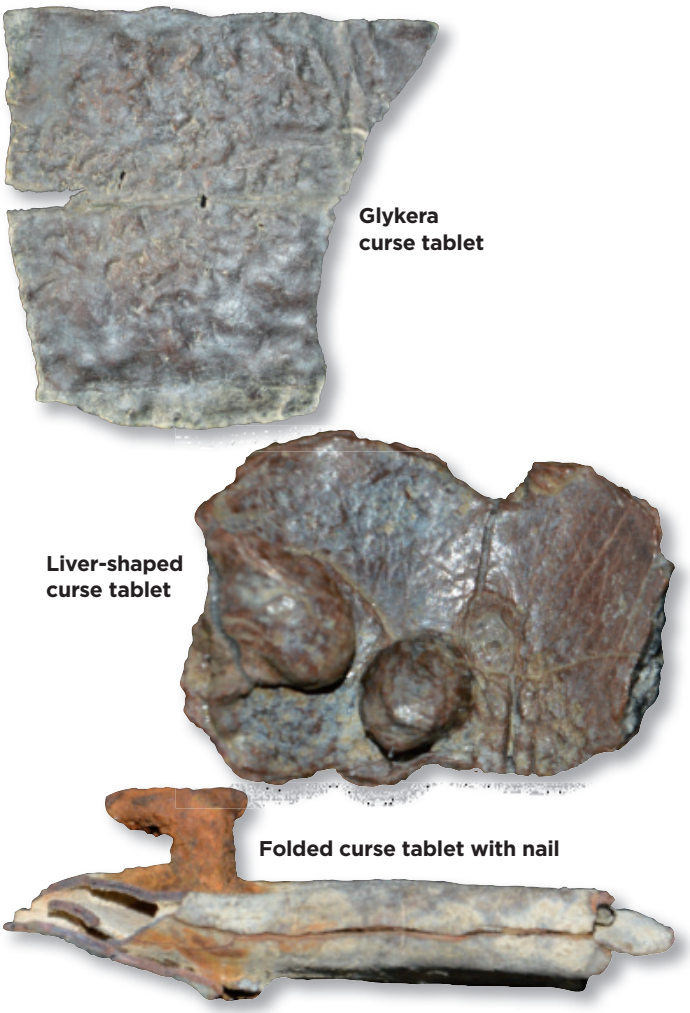
THE CURSING WELL


Well, Kerameikos, Athens, Greece



Thirty lead tablets recovered from the bottom of a public well at the edge of the Kerameikos necropolis in Athens have been found to record curses cast by Athenians against their rivals some 2,300 years ago. Several of the tablets were folded and pierced with nails, while others were fashioned in the shape of livers or coffins. A particularly scathing malediction condemns an allegedly promiscuous newlywed named Glykera and her vulva.

Until the late fourth century B.C., such Athenian curse tablets were usually deposited in tombs. At that point, according to the first-century B.C. Roman author and orator Cicero, the statesman Demetrius of Phaleron instituted a new law restricting elaborate burials and funeral practices. To evade detection by the officers employed to enforce this law, crafty sorcerers seem to have turned to wells as a more secretive venue for their magic rituals. The Greeks believed that water, and in particular groundwater, was a conduit to the streams of the underworld, explains archaeologist Jutta Stroszeck of the German Archaeological Institute in Athens. "Water nymphs protected the water," she says, "and were thus thought to be capable of directing the curses to the gods of the underworld."

—Benjamin Leonard

TRANSLATION OF GLYKERA CURSE TABLET:

"We curse Glykera the wife of Dion, to the gods of the underworld, so she be punished and her wedding be unfulfilled. I bind down Glykera, the wife of Dion, to Hermes Eriounios of the underworld, her vulva, her debauchery, her vice and everything of the sinful Glykera"

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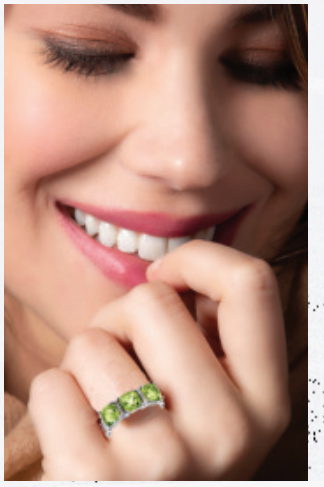

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Bone wall, Ghent, Belgium

IF THESE WALLS COULD TALK

Nine walls made up entirely of human bones have been uncovered by archaeologists at the site of the former Church of Saint John, now Saint Bavo's Cathedral, in Ghent, Belgium. Most of the remains have been radiocarbon dated to the second half of the fifteenth century, but the bones were likely not used for construction projects until sometime in the seventeenth or eighteenth century, when a section of the church cemetery was cleared to make room for new burials. "We have more than a thousand skeletons in all from in and around the church site," says project leader Janiek De Gryse of Ruben Willaert Restoration & Archeology/Decoration, "but these walls tell us something about the practice of clearing churchyards." She adds that future researchers will investigate whether the layering of bones was undertaken purely due to space limitations, or whether the walls may have held religious or spiritual significance.

—Marley Brown

WARRIOR STONE

A six-foot-tall monolith called the Tulloch Stone offers new evidence of the beliefs of the elusive Picts of ancient Britain, who resisted the Romans and later formed powerful independent Scottish kingdoms. Discovered by construction workers during a road project in central Scotland, the stone features a carving thought to date to the fifth or sixth century A.D. of a possibly unclothed man carrying a spear with a doorknob-shaped end. Similar figures, each holding an identical spear, are carved on two other Pictish stones that were found in cemeteries in Scotland dating to roughly the same period. Archaeologist Gordon Noble of the University of Aberdeen says that, rather than representing deceased individuals, all three carvings probably depict a pagan warrior god. "By the post-Roman period, this was very much a warrior-oriented society," Noble says. "These images seem to represent a distinctive regional manifestation of a warrior ideology."

—Benjamin Leonard

Tulloch Stone, Scotland

Digital model, Tulloch Stone

Drawing, Tulloch Stone

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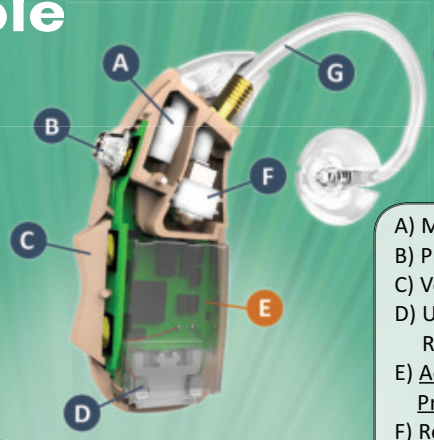

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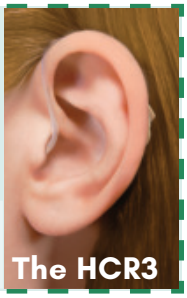

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AT PRESS TIME

The oldest known remains of a sake brewery in Japan have been unearthed by archaeologists in Kyoto. Discovered ahead of construction on the former grounds of the Zen Buddhist Tenryuji Temple in the city's Saga district, the brewery is believed to have been in use during the period leading up to the Onin War (ca. 1467–1477), a power struggle between the ruling Muromachi Shogunate and an alliance of rebellious feudal lords that ravaged Kyoto. The brewery remains include a cellar, storage jars, and a heavy wooden press, in which cloth bags holding unrefined sake were squeezed to produce the finished product.

Sake brewery, Kyoto, Japan

Sake press

"The facility is estimated to be approximately three hundred years older than one built in 1674 in Itami City, which was considered the oldest until now," says site director Masato Murao of the cultural heritage excavation and research firm Kokusai Bunkazai Co. Ltd. According to Murao, 17 sake breweries operating in the Saga district were recorded in 1425. He adds it is likely that monks and other members of the Tenryuji Temple made significant—and untaxed—profits brewing sake at the time.

—Marley Brown

POLYCHROME PATCHWORK

An Italian-Turkish team has unearthed the world's oldest-known polychrome mosaic floor at Usakli Hoyuk, a Hittite settlement in central Turkey. The partially preserved mosaic measures 23 feet by 10 feet and once adorned an open courtyard belonging to a building that archaeologists believe was a second-millennium B.C. temple. The mosaic, which was set into a beaten-earth surface, consists of more than 3,000 multicolored stones arranged in rectangular frames, each with three rows of alternating white, red, and blue-black triangles. Stone pavements served a practical function in Hittite architecture. "It's the way Hittites built their houses and public buildings, probably as a solution to prevent problems connected with rain," says archaeologist Anacleto D'Agostino of the University of Pisa. D'Agostino adds that these colored geometric patterns have not been found at other Hittite sites, and are thought to indicate the courtyard's association with performance of some kind of ritual.

—Benjamin Leonard

Polychrome mosaic, Usakli Hoyuk, Turkey

SCAREDY CATS

Imagine a scene where a troop of ape-like human ancestors a little more than four feet tall, with brains roughly equal in size to those of their evolutionary cousins chimpanzees, come upon a pack of large carnivores—say, lions or hyenas—feeding on a fresh carcass. Rather than run in fear from these predators, the hominins approach them screeching, waving their arms, and trying to be as frightening as possible. The carnivores, perhaps baffled or

Lioness

intimidated by this display, run away, leaving the hominins to feast on the fresh meat.

According to research by a team of European biologists, this type of scene may have been common enough to cause the extinction of large carnivores across East Africa. These extinctions became more frequent as early hominin brain size began to increase, perhaps about three million years ago. Using previously published data, the researchers were able to rule out climate change as the cause of these extinctions. The data also shows a correlation between large carnivore extinctions and increased hominin brain size. "The surprise was actually how clear the results are," says Søren Faurby, a biologist at the University of Gothenburg. Next, the researchers hope to document how widespread the impact of early hominin evolution was on other, perhaps less vicious, animals.

—Zach Zorich

ARMS AND THE WOMEN

Gold plate from Amazon's crown

When the ancient Greeks encountered the nomadic Scythians, who dominated the Eurasian steppe in the first millennium B.C., they recorded that they were deeply impressed by the spectacle of Scythian women riding into battle. Recently, a team excavating a fourth-century B.C. burial mound in western Russia found that it held the remains of four of these real-life Amazons. Two of the women were buried with horse tackle and weapons, and one of them had her legs positioned as if she were riding a horse. "We can certainly say that these two women were horse warriors," says team leader Valerii Guliaev of the Russian Academy of Sciences' Institute of Archaeology, "and we suppose that all four women in the grave were warriors." Guliaev also found that the burial mound held 30 iron arrowheads, and that one of the warriors wore a golden crown and took a dagger to her grave.

—Eric A. Powell

Amazon buried in equestrian pose, Russia

Amazon buried wearing crown, Russia

BIRDS OF A FEATHER

The ibis, with its brilliant white feathers and narrow, curved beak, was the sacred bird of Thoth, the ancient Egyptian god of wisdom and writing. Beginning about 600 B.C., ibises were frequently mummified and given as sacrifices to the god. "Pilgrims would offer an ibis mummy to Thoth on his feast day either to ask for a wish to be granted or to thank him," says archaeologist Sally Wasef of Griffith University. At the peak of this practice, upwards of 10,000 ibises were sacrificed every year, a number so large that some scholars have proposed that the birds must have been bred in centralized farms to meet the demand. Although more than four million ibis mummies have been found at the site of Tuna el-Gebel, which lies on the Nile River about 170 miles south of Cairo, no massive ibis breeding facility has ever been located. This has raised the question of whether such installations actually existed. An international team of researchers recently conducted a study of genomes from 14 ibis mummies dating to 2,500 years ago, and found a surprising degree of genetic diversity. The ancient birds were nearly as diverse as the modern population, which inhabits most of Africa. The researchers suggest that the ibises sacrificed by ancient Egyptians were probably imported from across the continent.

—Zach Zorich

Ibis sacrifice, Saqqara, Egypt

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VIKING KNIGHTS, POLISH DAYS

Sword hilt

The discovery of the burials of four medieval knights near the Polish village of Cieple has highlighted the region's connections to Scandinavia during the reign of the first Polish kings. The warriors were found lying in richly adorned chamber tombs dating to the early eleventh century A.D., the time of Bolesław I the Brave. They had been buried with a variety of weapons, including swords, spears, and daggers, as well as full sets of equestrian equipment, such as spurs, stirrups, bits, and buckles. Isotope and DNA analysis demonstrated, though, that these individuals were not locals, but instead likely immigrated from an area around Denmark. The four warrior tombs were found at the center of a necropolis that contained at least 60 other individuals, of both local and Scandinavian ancestry.

The men were likely members of an elite group of riders that ruled part of eastern Pomerania—present-day northern Poland—perhaps on behalf of the Polish kings, according to archaeologist Sławomir Wadyl of the Archaeological Museum in Gdansk. "Unfortunately, we do not know the story behind these men yet, nor how they came to settle south of the Baltic Sea," says Wadyl. "We also don't know exactly how they achieved their success, but we guess it was originally connected to their military service."

—Jason Urbanus

Viking warrior burial, Cieple, Poland

Upper portion of Neanderthal skeleton, Shanidar Cave, Iraqi Kurdistan

Z MARKS THE SPOT

Shanidar Cave, Iraqi Kurdistan

Sixty years ago, the discovery of four Neanderthal skeletons clustered together in Shanidar Cave in Iraqi Kurdistan led some scholars to conclude, controversially, that members of the extinct human species practiced burial customs. Since then, other scholars have questioned that interpretation, suggesting the quartet died together of exposure or during a rock fall. Now, a team co-led by University of Cambridge bioarchaeologist Emma Pomeroy has returned to Shanidar and unearthed the upper portion of a Neanderthal skeleton not far from where the four complete skeletons were originally excavated. Dubbed Shanidar Z, the bones were surrounded by sediment that had accumulated quickly, suggesting, says Pomeroy, that the body had been intentionally covered. Other remains of Neanderthals have been found in the cave, but they seem to date to as much as 30,000 years later than Shanidar Z and the other four burials. "All this evidence will contribute to our understanding of the complexity of Neanderthal treatment of the dead," says Pomeroy. "It may have varied across time, perhaps indicating different cultural traditions—a very human trait."

—Eric A. Powell

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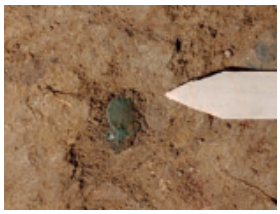
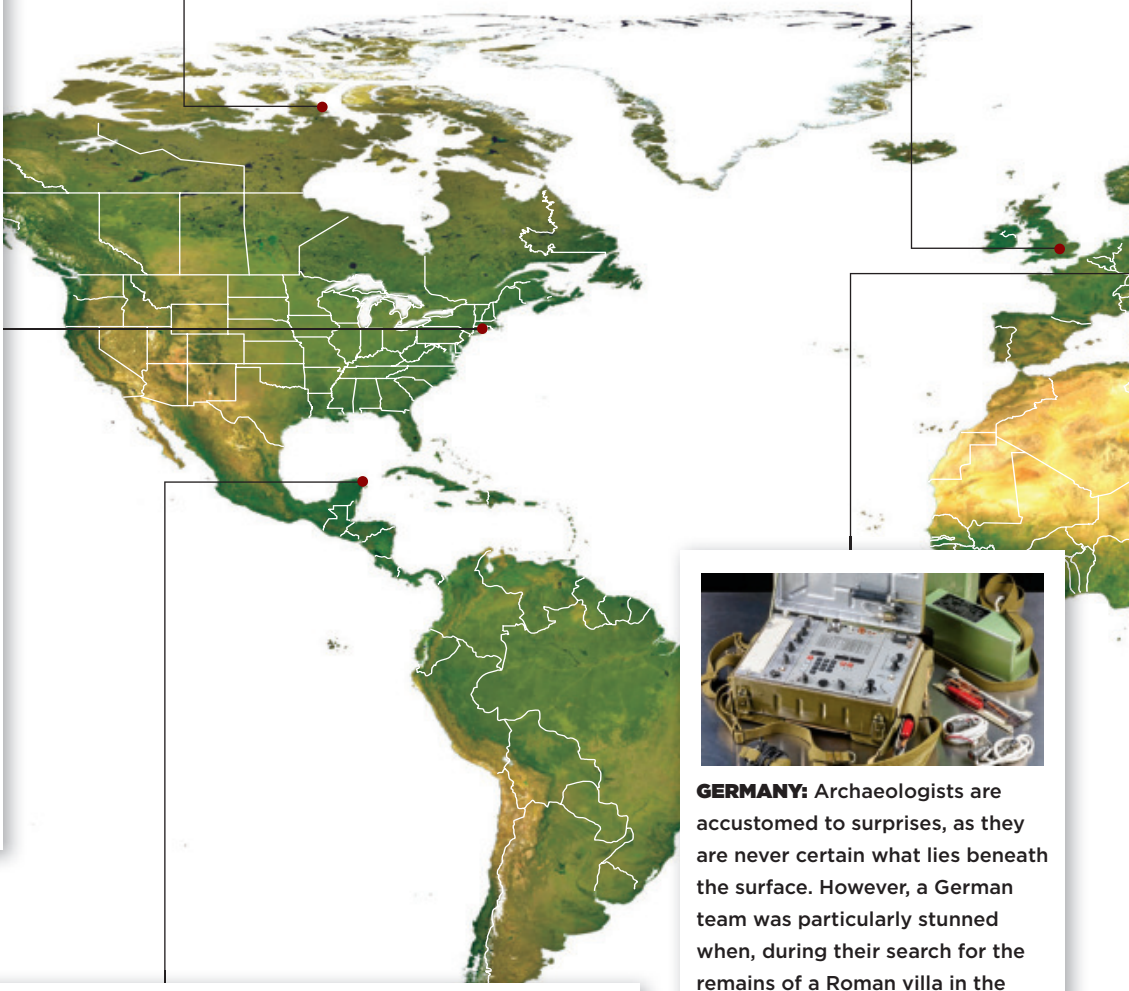
AROUND THE WORLD BY JASON URBANUS

CANADA: The two ships of the ill-fated Franklin Expedition, HMS *Erebus* and HMS *Terror*, mysteriously disappeared in the 1840s on their journey to locate the Northwest Passage. It was only in the last decade that the vessels' wrecks were finally located near King William Island, where the ships became trapped in ice. During recent exploration of *Erebus,* divers retrieved 350 artifacts, including ceramic dishes, hairbrushes, a lieutenant's epaulettes, and many personal items belonging to the captain's steward, Edmund Hoar.

ENGLAND: For decades, British politicians walking through the halls of Parliament passed a wooden panel with a tiny keyhole that, unbeknownst to them, provided access to a secret door. It was rediscovered after historians examined thousands of documents in anticipation of planned renovations. The entrance was originally installed for the coronation of King Charles II in 1661, to allow guests easier access from the House of Commons to a banquet in Westminster Hall. It was subsequently blocked up during the Victorian era and hidden from view.



CONNECTICUT: In a cellar in Ridgefield, construction workers unearthed the skeletal remains of 4 men who may have perished in the Battle of Ridgefield, a 1777 Revolutionary War engagement in which the Colonial forces were led by Brigadier General Benedict Arnold. Although the skeletons bear no apparent signs of trauma, researchers believe that dozens of 18th-century bronze and pewter buttons found in the graves indicate that the men were soldiers, although they do not yet know whether they fought on the British or American side.

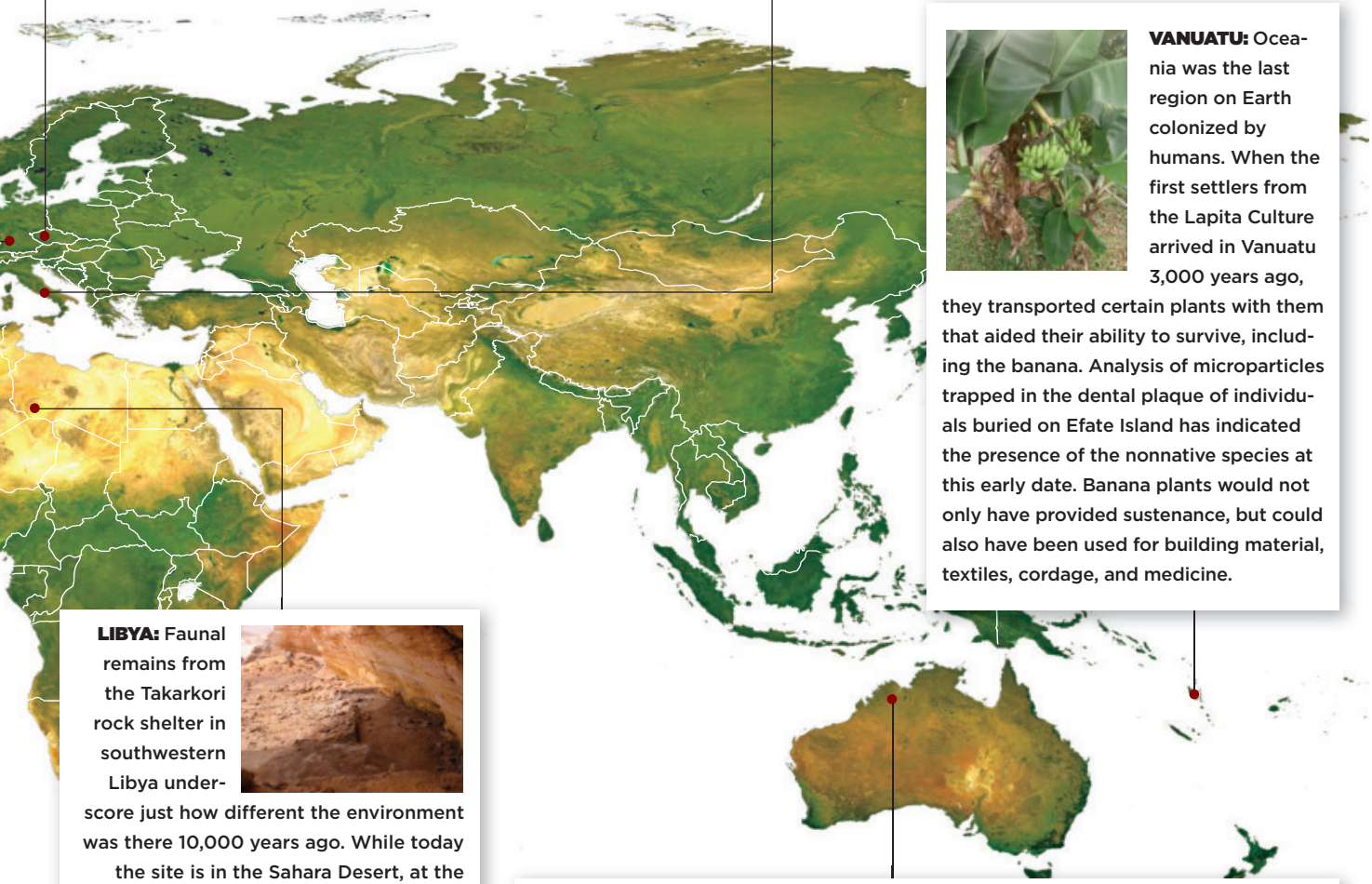


GERMANY: Archaeologists are accustomed to surprises, as they are never certain what lies beneath the surface. However, a German team was particularly stunned when, during their search for the remains of a Roman villa in the Hambach Forest outside Cologne, they instead dug up a metal box containing a Cold War–era Soviet spy radio. The radio, which could transmit messages up to 750 miles, may have been used by secret agents to pass on information about strategic sites in the area.

MEXICO: The great Maya "white road" that connected the cities of Coba and Yaxuna was an incredible feat of engineering. Built around A.D. 700, the 26-foot-wide road paved in white plaster extended more than 60 miles across the Yucatan Peninsula. Much of this route is today shrouded in thick vegetation, but a new lidar survey has provided researchers with high-quality images of the busy road's path. Using these images, they have detected many lost villages and more than 8,000 hidden structures that once lined the route.

CZECH REPUBLIC: Part of an early Neolithic well was uncovered during road construction in East Bohemia near the town of Ostrov. Researchers were impressed by the quality of its timber framing, especially given the fact that it was built and shaped using only stone or bone tools. Tree-ring dating has indicated that the trees used for the well's construction were felled in 5256 or 5255 B.C., making it the oldest wooden architectural structure ever discovered in Europe.

ITALY: Neanderthals have long had the reputation of being *Homo sapiens*' less sophisticated older cousins, but many recent studies have shown that they were more advanced than previously thought. Analysis of shell tools from Grotta dei Moscerini suggests that, 100,000 years ago, some Neanderthals were capable of diving for clams in shallow water. While the cave's Neanderthal inhabitants are known to have collected dead clams on the seashore, the new research indicates that some of the bivalves were harvested live, directly from the seafloor.

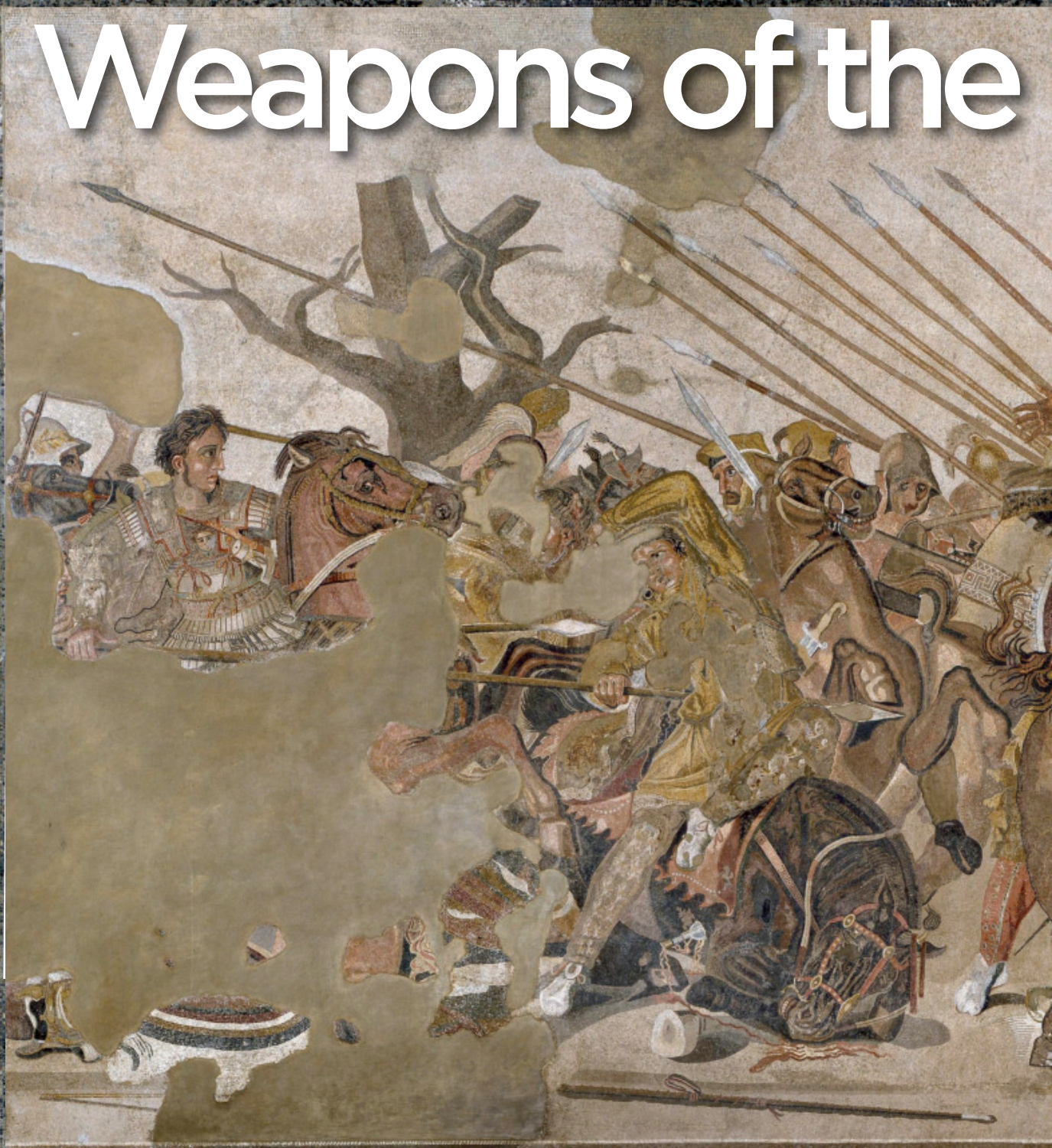


VANUATU: Oceania was the last region on Earth colonized by humans. When the first settlers from the Lapita Culture arrived in Vanuatu 3,000 years ago, they transported certain plants with them that aided their ability to survive, including the banana. Analysis of microparticles trapped in the dental plaque of individuals buried on Efate Island has indicated the presence of the nonnative species at this early date. Banana plants would not only have provided sustenance, but could also have been used for building material, textiles, cordage, and medicine.

LIBYA: Faunal remains from the Takarkori rock shelter in southwestern Libya underscore just how different the environment was there 10,000 years ago. While today the site is in the Sahara Desert, at the beginning of the Holocene period the area was dotted with lakes, ponds, and waterways. Humans used the shelter between 10,200 and 4,650 years ago. Their discarded food scraps around the site are giving experts insight into their diet. Of 18,000 bones thus far recovered, nearly 80 percent belong to fish species, mainly catfish and tilapia.

AUSTRALIA: Some very old rock art, such as the Gwion-style paintings that are found in the Kimberley region of Western Australia, is notoriously difficult to date because the pigments no longer contain organic material. However, experts were able surmount this challenge by instead dating organic material from millennia-old mud wasps' nests on rock facades that had been painted over by Aboriginal artists long ago. The researchers estimate that most of the paintings' enigmatic anthropomorphic figures were created 12,000 years ago.

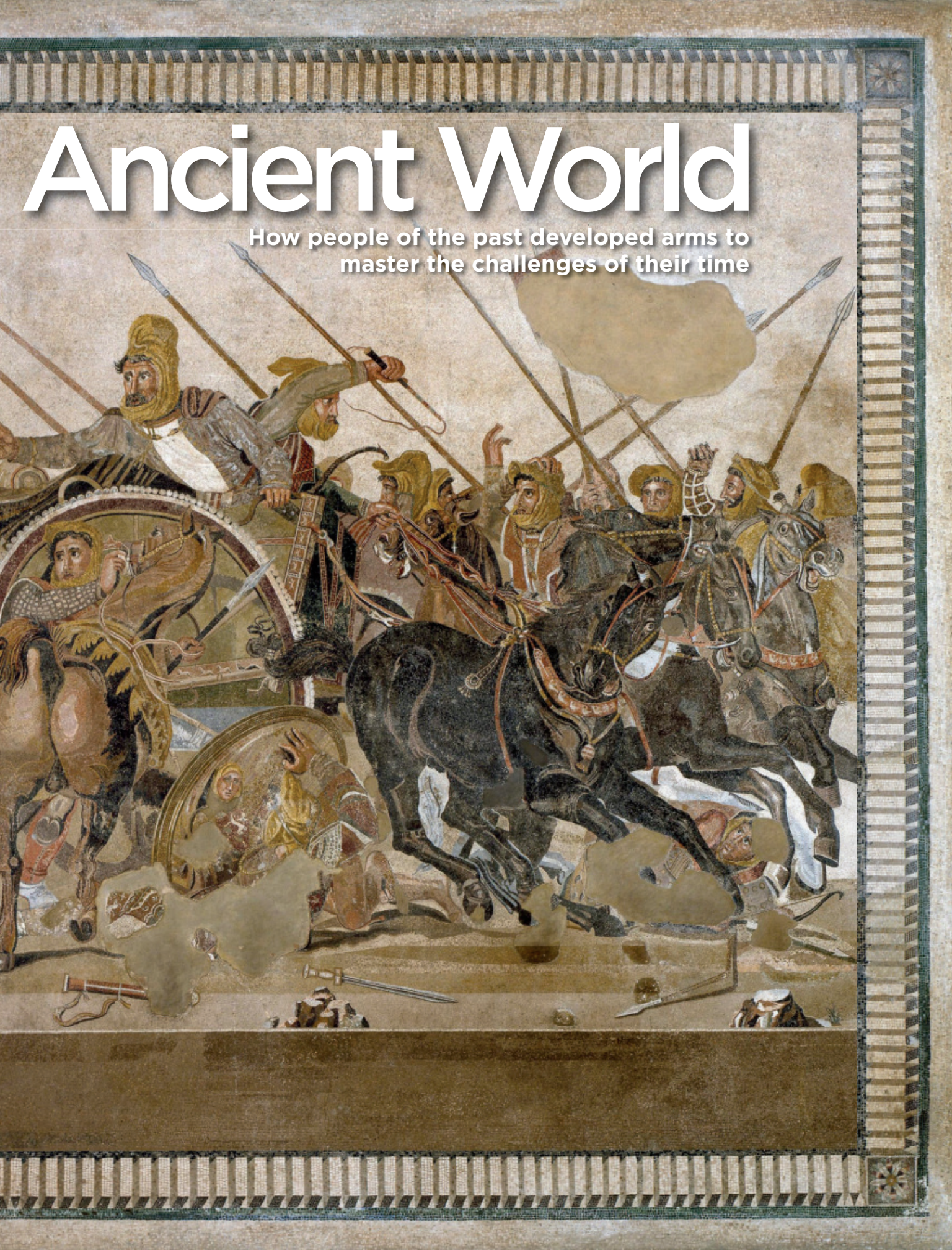
Weapons of the



The Alexander Mosaic, which was excavated in the House of the Faun in Pompeii, Italy, depicts the Battle of Issos, which pitted Alexander the Great (above, seated on brown horse) against the Persian army commanded by the king Darius III (above right, gesturing toward Alexander).

Ancient World

How people of the past developed arms to master the challenges of their time



5,300-year-old arrow, Italian Alps

20,000- to 16,000-year-old projectile point, Gault site, Texas

5,300-year-old bow, Italian Alps

300,000-year-old wooden spear in situ, Schoningen, Germany

Wooden spearhead, Schoningen, Germany

HUNTING EQUIPMENT

Hunting is known to be an ancient practice, but just how ancient was made clear by a discovery in a coal mine outside Schoningen, in northern Germany. There, archaeologists uncovered nine wooden spears, along with the remains of several dozen butchered horses. The spears have been dated to around 300,000 years ago, meaning they were likely used by early Neanderthals. This countered the belief of some scholars that early humans were scavengers who had not yet mastered hunting.

The spears, which measure around seven feet long, were produced by experienced weapon makers who planned their hunts in advance, says archaeologist Nicholas Conard of the University of Tubingen, who oversees excavations at Schoningen. All but one spear was made from spruce trees that had grown slowly in cold conditions, producing especially hard wood. The shafts were designed to be thicker, and therefore heavier, near the front, lending them greater stability in flight, and the tips were carved slightly off-center, to avoid the soft pith at the tree trunks' cores. "They knew exactly what they were doing," says Conard.

The Schoningen spears were likely thrown by hand, making them most effective at close range. Much later in hominin development, modern humans devised spear-throwers called atlatls that allowed them to fling projectiles at greater velocity and hunt game from farther away—likely providing an advantage over Neanderthals. A number of stone points recently discovered at the Gault site, in central Texas, were most likely hafted onto wooden shafts and hurled with atlatls at targets such as bison and mammoths, says Tom Williams of the Texas Archeological Research Laboratory at the University of Texas at Austin. The points have been dated to between 20,000 and 16,000 years ago, making them the oldest projectile points unearthed in the Americas.

Even more powerful than the atlatl is the bow and arrow, though ancient archery equipment made of perishable materials rarely survives. An exception is the bow, bowstring, quiver, and arrows found with the ice mummy Ötzi, who died high in the Italian Alps some 5,300 years ago. The 14 arrows found in Ötzi's doeskin quiver were made from branches of the wayfaring tree. Two of these arrows were ready to be fired, a trio of feathers still stuck to their ends with birch tar glue and nettle fibers. This design, with feathers arranged to produce a straight flight path, has remained virtually unchanged since.

—Daniel Weiss

SHIELDS

Iron Age wooden shield, Enderby, England

Given its life-saving potential, a shield might be a warrior's most important resource. Although spectacular metal examples such as the Battersea Shield are well known, it's the rare survival of shields fashioned from perishable materials that has produced a new understanding of the construction of these protective devices in Iron Age and Viking Age Europe. During a recent excavation near Enderby in central England, archaeologists discovered an Iron Age (ca. 750–43 B.C.) shield made of bark—the only such shield ever found in Europe. "The Enderby shield is a missing part in a whole sphere of organic shields, which must have once been abundant," says archaeologist Matthew Beamish of University of Leicester Archaeological Services (ULAS). Some scholars have thought that the design of bark or wooden shields was based on metal examples, but the ULAS team suggests that the slight hourglass shape of Iron Age metal shields may instead have been modeled on the distinctive look produced by the drying process of bark or wood. Such bark or wooden shields were likely suited to light combat, where the relative weightlessness of the organic material offered a greater advantage than did the impregnability of a metal shield, explains Beamish.

The impact of materials technology on the style of combat is also at the center of archaeologist Rolf Fabricius Warming's recent investigation of shields made of animal hide. "Although it rarely survives in the archaeological record, hide has long been recognized as an essential component of shield construction used to reinforce extremely thin, easily splintered wooden shield boards," says Warming, who is the founder of the Society for Combat Archaeology. Until now it hasn't been possible to determine which animals the hides came from. Microanalysis of four Iron Age and Viking Age shields revealed that the hides employed were largely bovine skins, and that both deliberately tanned leather and rawhide were used, depending on what type of shield was required. "Hide was like the plastic of the age and could be processed into various products with different physical properties and levels of durability," says Warming. "This dictated, or at least greatly influenced, the nature of combat and the fighting tactics of a shield's carrier."

—Jarrett A. Lobell

Iron Age bronze shield, Battersea, England

Viking wooden shield, Trelleborg, Denmark

City wall, Pompeii, Italy

Medieval catapult stone, Hay-on-Wye, Wales

SIEGE WEAPONS

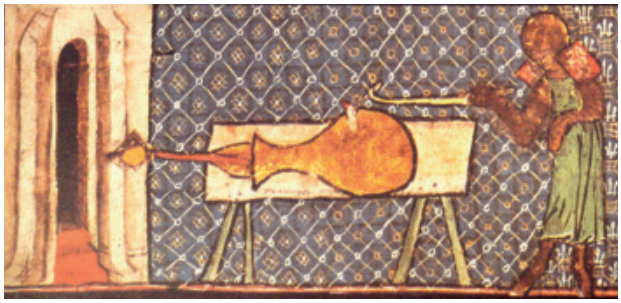
Some time around 89 B.C.—the exact year is debated—Roman forces led by the general Lucius Cornelius Sulla laid siege to the city of Pompeii, likely in response to its residents' agitation for full Roman citizenship. The walls on the city's north side, where fortifications were particularly weak, still bear the impact marks of projectiles fired by the attacking Romans. In a number of areas inside the city walls, archaeologists have found catapult balls, small lead sling-shot bullets, and machine-launched arrows known as scorpio bolts, all fired during the siege. "I don't think anyone at the time was under any illusions that sustained bombardment would actually bring down the walls," says archaeologist Ivo Van der Graaff of the University of New Hampshire. "It looks like one of the Romans' tactics was to just fire munitions into the city to cause damage and, perhaps, lower morale."

By the Middle Ages, engineers had perfected projectile-launching machines that could wreak havoc on even the most robust fortifications. During recent excavations at Hay Castle in southeast Wales, archaeologists unearthed a thirteenth-century stone ball catapulted from a siege machine called a trebuchet. The 63-pound stone is roughly the same size and weight as catapult balls excavated at other Welsh castles. "Only multiple impacts in the same place would demolish a wall," says archaeologist Chris Caple of Durham University. "Trebuchet balls were deliberately created to be the same weight and size so they would all land in the same spot when fired." Although researchers haven't yet found other archaeological evidence of a siege at Hay Castle, documents record multiple fires and attacks during the thirteenth century, including one in July 1265, when the nobleman Simon de Montfort, King Henry III's leading opponent, took the castle with the aid of allied Welsh princes.

—Benjamin Leonard

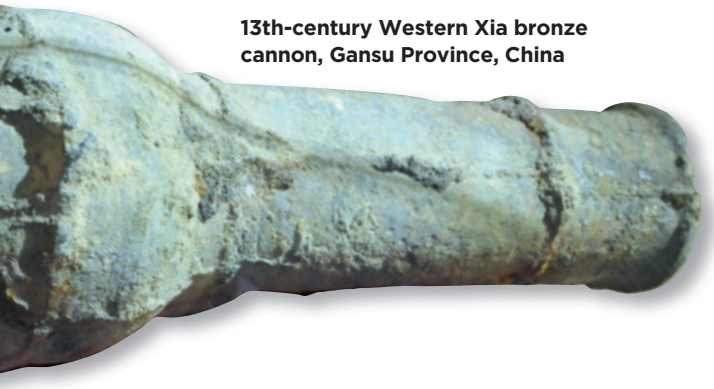
FIRE LANCES AND CANNONS

Earliest European illustration of a cannon, dating to 1326



In the ruins of Xanadu, the summer capital of the Mongol emperor Kublai Khan (r. A.D. 1260–1294), Chinese archaeologists unearthed one of the world's earliest surviving guns. Measuring just 14 inches long, the bronze hand cannon was stamped with a serial number and a date corresponding to A.D. 1298. The small cannon was fashioned by Chinese artisans who benefited from working in a tradition of gunpowder weaponry that was already at least 400 years old. Some time just before the rise of China's Song Dynasty (A.D. 960–1279), alchemists in search of new medicines found that, by combining nitrates such as saltpeter with sulfur and charcoal, they could create a chemical explosive. The Chinese word for gunpowder means "fire medicine," but Song Dynasty officials were soon using the compound to construct simple explosives such as fire arrows and, in time, bombs. "People often think Europeans were the first to understand the military implications of gunpowder," says Emory University historian Tonio Andrade. "But the Chinese understood gunpowder's potential very early on." By A.D. 1150, Song soldiers were using bamboo and wood proto-guns known as fire lances that were essentially flamethrowers.

Historians have long regarded the Song Dynasty as militarily weak because the nomadic Liao, Jin, and Western Xia Dynasties encroached on its territory before it finally



13th-century Western Xia bronze cannon, Gansu Province, China

15th-century illustration of a cannon

fell to the Mongols in A.D. 1279. Andrade points out that, in this turbulent period, these confrontations likely spurred rapid innovations in gunpowder warfare, leading to the creation of weapons that might be recognized today as guns. "What a gun looked like then is blurry by our standards," he says. "Even the Xanadu gun may have been more like a fire lance than what we think of as a gun."

Two early metal cannons that seem to have functioned as guns have been unearthed in China's northwestern Gansu Province, the domain of the Western Xia (A.D. 1038–1227). They bear no inscriptions, but based on the area where they were excavated, they may date to the early thirteenth century A.D. One cannon was even discovered with an iron ball and a measure of gunpowder still in its barrel. By A.D. 1227, the Mongols overwhelmed the Western Xia and went on to embrace gunpowder warfare. Guns spread throughout Asia in the wake of the Mongol conquests, reaching Europe by A.D. 1326. That year, the first known European illustration of a cannon appeared in a Latin treatise on the proper behavior of kings.

—Eric A. Powell

BASHERS

Ca. 16th-century wooden war club, Caribbean

The use of a blunt object to strike an opponent may be the simplest—and the oldest—method of armed combat. Two artifacts separated by an ocean and more than five millennia, however, illustrate that items appearing to have this particular function may actually have been designed and used for multiple purposes. The first, a club known as the Thames Beater, was discovered in the mud on the banks of England's Thames River and dates to around 3500 B.C. The beater was likely a utilitarian object employed in a variety of daily activities, as well as for self-protection. "Single-function weapons of violence are largely absent in the Neolithic period in Western Europe," says archaeologist Linda Fibiger of the University of Edinburgh. "We tend to think of them as weapon-tools that probably had multiple functions, which could include use as a weapon."

Late 16th-century illustration from the Drake Manuscript

The second artifact, an ornately carved war club, was originally recovered in the 1970s from the wreck of the Spanish ship *San Pedro*, which sank off the coast of Bermuda in 1596. It may have been used in combat only sparingly, if at all. This type of club, which rarely survives, was wielded by Carib-speaking people from the region surrounding the mouth of the Orinoco River in Venezuela and on the Caribbean islands to the north. Some examples were collected as curios by early colonial explorers. "These clubs were formidable weapons made of heavy, durable wood, though their considerable length would have made them somewhat unwieldy, unless you were a certain distance from your opponent," says archaeologist Joanna Ostapkowicz of the University of Oxford. "I would think this style of weapon became more linked with status—the longer and more impressive your club, the higher your standing in the community."

—Marley Brown

Thames Beater, Thames River, England

CEREMONIAL AND MAGIC WEAPONS

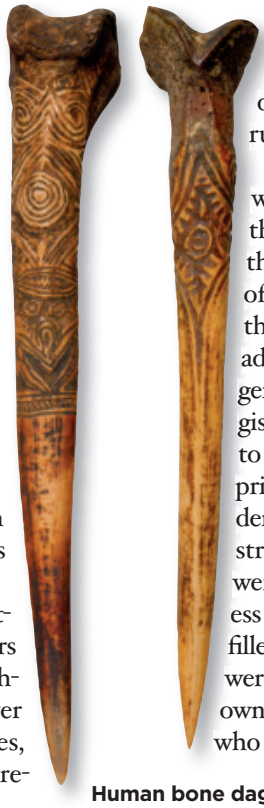
Weapons are, of course, instruments of violence. Occasionally, though, they assume symbolic importance that transcends their martial purpose and comes to represent the power and authority their possessors hold over others. At times, some ancient weapons were seen as mystical items, endowed with supernatural properties.

Maces were closely associated with the earliest Egyptian rulers. They could be used to crush an opponent's skull in close combat but were also seen as important symbols of pharaohs' strength and supremacy. Some ancient examples, such as the approximately 5,000-year-old mace-head of King Narmer, were not intended to be used in battle, but were explicitly designed to serve as ceremonial or votive objects. This mace-head was carved with scenes from Narmer's life that emphasized his authority and the subjugation of his enemies.

In medieval Europe, some workshops attempted to imbue their swords with magical powers by inscribing the blades, as seen on a thirteenth-century weapon pulled from the Witham River in England. These often indecipherable messages, which include clearly Christian symbols, were presumably intended to invoke God's protection in battle. They are part of a Germanic tradition dating to pre-Christian times in which magical runic symbols were etched onto blades.

The symbolic and supernatural nature of ancient weapons is perhaps best embodied by bone daggers that were widely used in New Guinea. Traditionally, these lethal objects were made from the leg bones of cassowary birds. In special circumstances, though, they could be shaped from the femur of a fallen adversary or a deceased relative. "Human bone daggers were rare," says Dartmouth College anthropologist Nathaniel Dominy. "To possess one, a man had to have killed another man in combat or have appropriated his dead father's femur." Recent research has demonstrated that these human bone daggers were stronger than their cassowary counterparts. They were also evocative symbols of the ferocity and prowess of those who wielded them. "These weapons were filled with substantial strength," says Dominy. "They were manifestations of spiritual power and allowed the owner to lay claim to the rights and powers of the man who had surrendered the bone."

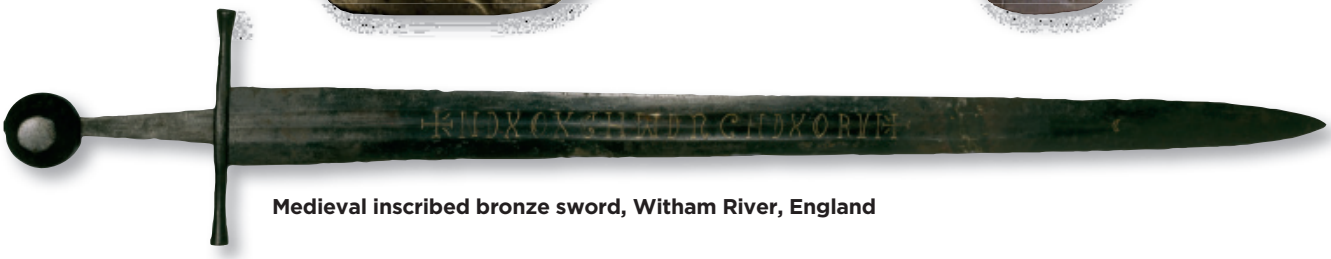
—Jason Urbanus



Human bone daggers, New Guinea

Ca. 5,000-year-old stone mace-head, Egypt

Ca. 5,000-year-old stone Narmer palette, Egypt



Medieval inscribed bronze sword, Witham River, England

Roman mosaic of a *retiarius* versus a *secutor*

Roman gladiator fresco, Pompeii, Italy

Roman bronze gladiator helmet, Italy

GLADIATOR WEAPONS

Gladiatorial contests were wildly popular among the ancient Romans, drawing tens of thousands of spectators. At first, the bouts were simple affairs, fought between combatants lightly armed with swords or spears. But as these events grew more popular and involved a greater number of fighting pairs, the Romans boosted their entertainment value by pitting gladiators who specialized in different sets of weapons, armor, and fighting style against each other. This increased the unpredictability of a match's outcome. For example, a *secutor* carried a short sword and a large shield and wore a rounded helmet that covered his entire head, except for two small eyeholes. A secutor often opposed a *retiarius,* who was equipped with a net in one hand and a long trident in the other. Other classes of gladiators included the *dimachaerii,* who carried two short curved blades; the *equites*, who fought on horseback; the *essedarii*, who rode chariots; and the *laqueatores*, who stalked their opponents with lassos and daggers.

While some ancient written sources describe these various types of gladiator, mosaics and frescoes capture their appearance. One such fresco was recently unearthed in a tavern in Pompeii. The vivid scene depicts two gladiators—a *murmillo* ("fish-man") and a *Traex* ("Thracian"). The murmillo is recognizable by his visored helmet, right arm guard, left shin guard, large rectangular shield, and short sword. The Traex wore a similar wide-brimmed crested helmet, but carried a smaller shield and a short curved sword. He is portrayed wearing a characteristic protective belt and thigh-high greaves. In the Pompeian fresco, at least, the murmillo clearly has the edge—he is depicted triumphantly holding up his shield while blood gushes from wounds to his opponent's wrist and chest.

—Jason Urbanus

MEGASITES OF UKRAINE

Massive 6,000-year-old settlements are revolutionizing how archaeologists understand ancient cities

By Megan Gannon

The remains of an almost 2,000-square-foot wattle-and-daub "megastructure" were exposed at the site of Maidanetske in Ukraine. Such structures were built by members of the Trypillia Culture about 6,000 years ago, and some are among the largest buildings in prehistoric Europe. A Trypillia ceramic figurine (right) depicts a woman.

THE STORY OF URBANISM traditionally begins in what is today southern Iraq. There, around 5,500 years ago, the Sumerian settlement of Uruk developed on the banks of the Euphrates River. At its peak, some 50,000 people, including nobles, artisans, merchants, and slaves, are thought to have lived within the city's mudbrick walls, which enclosed two square miles. This large urban population existed thanks in part to an agricultural surplus managed by a centralized bureaucracy that tracked economic transactions on cuneiform tablets. But a few hundred years before Uruk emerged, some 1,700 miles to the northwest in the forest steppe of central Ukraine, farmers with no written language were already living in settlements so large they sprawled over an area up to 1.5 square miles, and were home to perhaps as many as 20,000 people. In age and size, these so-called Trypillia megasites rivaled the earliest cities of Mesopotamia. But that's where the similarities end.

While imposing central temple complexes anchored cities such as Uruk, a typical Trypillia megasite featured an empty space in the middle surrounded by thousands of identical homes arranged in oblong concentric rings. Archaeologists believe that the farmers who lived in these huge settlements thrived without rulers, without monuments, and without wealth disparities, all elements that were present at Uruk and other early cities. "We're sure that they're not cities in a classic sense," says John Chapman, a Durham University archaeologist. "They're probably egalitarian, but that sort of idea is really new to urban studies. Who ever heard of an urban center that's not run by a strong hierarchy?" Understanding these contradictions offers a real challenge for archaeologists working at Trypillia sites.

In the last decade, Chapman and a team from Germany's Kiel University have joined efforts led by researcher Mikhail Videiko of Borys Hrinchenko Kyiv University to explore how people came together to live in such unusual arrangements, and why, after 500 years, the megasites' inhabitants seem to have left the settlements for good. Using noninvasive techniques such as magnetic surveys combined with modern excavation methods, the archaeologists have been steadily discovering new elements of the megasites, including some of the largest structures ever built in prehistoric Europe. In so doing, they are questioning long-held assumptions about what forms urban life may have taken in an era before cities as they are understood today spread across the globe.

THE PEOPLE WHO LIVED in the megasites belonged to a larger culture known as the Cucuteni-Trypillia, which flourished in the region northwest of the Black Sea during the Copper Age (ca. 5000–2800 B.C.). Archaeologists first learned about the Cucuteni-Trypillia Culture in the late nineteenth century when farmers in the region plowed up ceramics decorated with swirling patterns as well as the charred remains of clay building materials imprinted with wood. Since then, more than 5,000 Cucuteni-Trypillia sites have been found, ranging from small farmsteads to the megasites, over a large swath of present-day Ukraine, Moldova, and Romania. Scholars discovered that the people living at

An artist's reconstruction of Maidanetske shows houses at the "megasite" laid out in oblong concentric circles surrounding a large empty area.

these sites harvested cereals and kept livestock, and that they were linked by shared traditions of pottery making, copper toolmaking, production of clay figurines, and construction—and eventual burning—of wattle-and-daub dwellings.

The megasites are concentrated at the eastern end of the region occupied by the Cucuteni-Trypillia Culture, in the mostly flat, fertile land between the Southern Bug and Dnieper Rivers in Ukraine. In their early phases, Trypillia settlements were small, rarely covering more than seven acres, but around 4100 B.C., giant sites began to emerge. Little evidence of widespread violence or warfare has been discovered at the sites, suggesting people did not gather in such huge groups as a defensive strategy. However, new technologies, such as animal sledges and wheeled wagons, also emerged in the region around this time. These may have allowed people to transport harvests quickly over great distances, perhaps facilitating the growth of these large population centers.

By the late 1940s, Soviet archaeologists had excavated about 200 houses at a megasite called Volodymyrivka. But the full scale of Trypillia settlements was only appreciated once they could be observed from the air. In the 1970s, Soviet aerial surveys and subsequent investigation on the ground revealed that at least 10 of the Trypillia settlements covered an area of four-tenths of a square mile or more and contained as many as 1,000 dwellings each. Up to 40 megasites have so far been identified. The largest, Taljanky, measures nearly 1.5 square miles.

In 2011, Videiko and the Kiel University team, led by archaeologist Johannes Müller, began excavating at a site known as Maidanetske. This was one of the densest Trypillia settlements, made up of 3,000 houses that were inhabited from 3990 to 3640 B.C. Chapman and his Durham University colleagues also began working with Videiko at Nebelivka, a megasite that was occupied at roughly the same time. At both sites, the archaeologists used magnetometers to detect materials such as burned clay, soil, and wood. The researchers identified trackways, pits, and ditches, as well as burned and unburned houses that had been invisible to the earlier Soviet researchers. "Now we have better opportunities to target more specialized features that they couldn't see back then," says Kiel University archaeologist René Ohlrau.

Both Maidanetske and Nebelivka were constructed accord-

ing to a plan to which all Trypillia megasites seem to conform. The central unbuilt area, which may have housed livestock such as cattle, was surrounded by concentric roads lined with uniform houses that measured about 750 square feet on average. The houses seem to have been grouped together in discrete neighborhoods. Double-chambered pottery kilns were dispersed throughout the sites, as were pits that were originally dug to harvest clay for construction and then refilled with waste and deposits of figurines.

By most indications, the megasites weren't just villages that spilled over their original borders, but rather were carefully planned from their founding. When the Ukrainian-German team investigated the chronology of the buildings and features at Maidanetske, they discovered that even during the settlement's earliest stages, when it contained only a few pottery kilns near the center, a circular enclosure had already been dug around a huge perimeter. "They got the area ready and then they occupied it," says Müller. "They had the concept and the demarcation of the place from the beginning." The researchers estimate the site was eventually home to at least 10,000 people.

Nebelivka, too, was a massive, carefully planned settlement. However, the Durham researchers also discovered environmental evidence that they believe suggests the site may not have supported thousands of people year-round. To reconstruct the human footprint on the prehistoric environment, the team extracted a 20-foot-deep column of river sediment near the edge of the site. Ancient layers of soil can retain traces of pollen, charcoal, and other botanical remains that create an archive of past phenomena such as deforestation, cereal production, fires, and soil erosion. The researchers found far less impact than they expected from the era of megasite occupation if, indeed, thousands of people had lived there at the same time during this period.

Chapman and his colleagues posit three possible explanations for Nebelivka's minimal impact on the surrounding landscape. One possibility is that the site was a permanent settlement, but much smaller than its final layout suggests, with new houses built as others were deliberately burned down. The archaeologists believe this would have left just about 400 homes occupied at any time. Another possibility is that the megasite was a regional center where an annual assembly took place, and that only a small group maintained the site year-round. Or perhaps, the researchers suggest, Trypillia megasites were spiritual centers that people in the wider region might have visited for a short period during a pilgrimage season.

Videiko, however, is not convinced that the environmental results at Nebelivka pose a serious challenge to the idea that Trypillia megasites were permanent settlements. He points to other sites in the Cucuteni-Trypillia world where excavations have yielded evidence suggesting that year-round settlement by large populations was the norm.

A clay figurine (left) in the shape of a cow found at Maidanetske and a depiction (right) of a bull on wheels are among the many zoomorphic figurines that have been discovered at various Trypillia sites.

The surveys at Maidanetske and Nebelivka have also revealed the presence of multiple massive buildings that were up to 17 times as large as typical Trypillia houses. Videiko and Chapman have dubbed these buildings megastructures. Before their excavation, researchers were certain that they served an important role in their neighborhoods, but were unsure what that role was. In planning their excavation of the largest megastructure at Nebelivka, the team expected to uncover artifacts and features related to centralized food storage, administrative activities, or religious rituals. But they were surprised by what they found—or didn't find—when they actually started digging.

Measuring 200 feet long and 65 feet wide, the partially roofed building is one of the largest structures ever built by prehistoric people in Europe. However, the team found little that distinguished it from a typical home, aside from a potentially monumental eastern entrance. "There were actually fewer finds than in a normal house," says Chapman. If people were indeed performing religious, administrative, or business

tasks in this public space, they brought what they needed in and carried it out. The most notable of the scant artifacts in the huge building are a set of miniature ceramic drinking cups, a collection of small clay cones that may have been administrative markers for counting—like pieces of a rudimentary abacus—or gaming pieces, and a single, spiral-shaped gold hairpin, the first gold ornament found at a Trypillia site.

When the Ukrainian-German team excavated one of the 13 megastructures at Maidanetske in 2016, they also unearthed few artifacts apart from fragments of pottery vessels used for eating and drinking, alongside animal bones and carbonized cereal grains. This led them to conclude that these large buildings were not used by the Trypillians as specialized administration facilities or central storage halls, but rather were likely assembly houses where the population would gather for decision-making, feasting, and rituals. Among egalitarian tribal societies in the Americas, Oceania, and Africa, ethnographers have documented similar public assembly halls or plazas where people perform group activities and make decisions to maintain the social order. The Ukrainian-German team then compared 104 megastructures identified by remote sensing at 19 different Trypillia settlements. They found that each site had up to three large megastructures, and up to 20 smaller satellite megastructures that would have allowed communal gatherings to take place at the neighborhood level.

In the ancient world, evidence of social hierarchies is often preserved in the graves of the wealthiest individuals, who tend to be buried with artifacts signaling their station. Thus far, no cemeteries have been discovered associated with Trypillia megasites—whatever sort of funerary rites they practiced, they don't seem to have left a trace. And across the Trypillia world, archaeologists have found no evidence of social differentiation among households. The fact that the megastructures at Maidanetske and Nebelivka also offer no evidence of centralized administration seems to support the theory that the people residing at Trypillia megasites managed to thrive without recognized leaders. "Certainly every individual within these megasites had their own identity," says Müller. "They had their neighborhoods, they had their ancestors, they had their economic ties. But my opinion is that we are not dealing with a socially stratified society."

At the time the megasites emerged, there was nothing like them in the world. No one was living in settlements so large, meaning the Trypillians' decision to build such massive sites was an unprecedented feat of imagination, or, as Chapman and his colleagues put it, "a giant leap into the dark." Understanding this phenomenon challenges archaeologists' assumptions about how ancient people chose to organize themselves. "The expectation for a very long time has been that as soon as you get thousands of people living together in close proximity anywhere in the world, you should expect certain things to be happening," says University College London archaeologist David Wengrow. Archaeologists have traditionally envisioned the centralization of government, the invention of complex administrative systems, and the development of social inequal-

A pottery kiln (top) excavated at Maidanetske dates to the settlement's original occupation, around 4000 B.C. An aerial view (above) shows an ordinary dwelling at the site.

This reconstruction (above) of a two-story Trypillia dwelling at the site of Nebelivka was set on fire as part of an experiment to determine how such houses burned. A Trypillia ceramic model (right) depicts a wattle-and-daub structure.

ity to be essential prerequisites of urban centers. "There tends to be a tacit view that in order for any social system to become complex, it also has to be highly exploitative and organized along authoritarian lines," says Wengrow, who believes this way of thinking may be misleading. Trypillia societies were complex—their members planned massive settlements and organized a huge population. They just appear to have done so without a centralized power.

In 2015, Chapman and his colleagues built a two-story replica of a typical Trypillia house near Nebelivka and packed it with 420 trees' worth of wood. They then set the building on fire and watched as it burned. The experimental burning and a subsequent excavation of the charred ruins two years later were intended to help answer questions about how the megasites were ultimately destroyed. Based on the amount of wood they had to collect for the project, the researchers found that burning houses at the Trypillia sites would have required as much as 10 times the amount of timber that had been used to build them. This suggests that the destruction was a deliberate act that would have required a tremendous amount of labor. The Trypillians likely intentionally burned their homes, and perhaps entire megasites, before they left them.

Previous generations of scholars believed the megasites were abandoned after the arrival of nomadic people in the area roughly 5,500 years ago, conjuring images of invaders on horseback sweeping in from the steppes to the east and sacking sites such as Nebelivka. But excavations across the Trypillia world now show that the last days of the megasites weren't marked by violence, and that people didn't leave these settlements to become nomads. Rather, Trypillia society endured in smaller, more dispersed settlements for another 400 years after the last megasite was deserted around 3600 B.C. This suggests that the abandonment of these huge centers may have been linked to cultural change rather than a distinct event. "There was some kind of social collapse in the networks that had made these megasites possible, that had given them their real meaning," says Chapman.

Müller believes the megasites were ultimately a failed experiment in scaling up a way of life based on the egalitarian decision-making that had worked well in smaller groups. His team's analysis shows that over time, megasites tended to have fewer and fewer megastructures. If those large-scale buildings were the spaces where neighborhood assemblies gathered, the loss of the megastructures could signal that the groups' mode of self-governance had broken down and that rulemaking was perhaps becoming less democratic as the population grew larger. "How would they make decisions?" asks Müller. "I think that's a big problem they were dealing with."

The social system that led to the megasite phenomenon may have come to an end, but Ohlrau says it is remarkable that people lived this way for up to half a millennium. "We should focus on the fact that egalitarian decision-making was stable for several hundred years," he says. "Did the 'social experiment' ultimately fail? Yes. But, from a historical perspective, which social formation doesn't fail in the end?" For his part, Wengrow thinks the megasites may offer useful lessons to inform the future of urban development. "Every year, more and more of the world's population will be living in cities—or megacities—and there's a whole package of assumptions about what that is going to mean," he says. "Places like the megasites challenge those assumptions and show that there are a lot more possibilities out there and a lot more potential for human creativity than we have tended to assume." ■

Megan Gannon ***is a journalist based in Berlin, Germany.***

A PATH TO FREEDOM

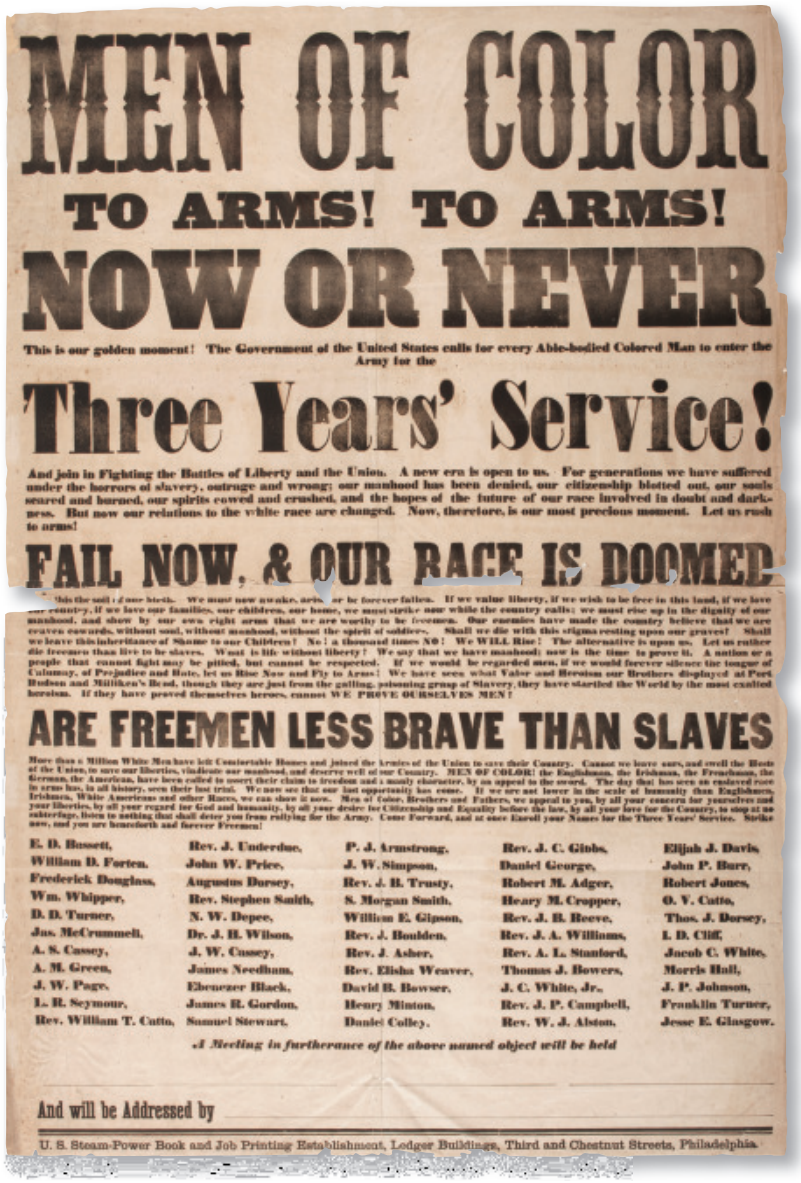
At a Union Army camp in Kentucky, enslaved men, women, and children struggled for their lives and fought to be free

By Jarrett A. Lobell

THE ONLY COMPLETE ORIGINAL building still standing at Camp Nelson in Jessamine County, Kentucky, is a sizeable house built around 1850 for the just-married Oliver Perry and his bride, the former Fannie Scott, whose family owned the land on which the house sits. It is now called simply the White House. But between 1863 and 1865, at the height of the Civil War, it was just one of more than 300 structures in the center of the camp's 4,000 acres that housed all the required resources for an army at war. These included a supply depot, hospital, commissary, prison, ordnance storage facility, stables and corrals, a 50,000-gallon reservoir, woodworking shop, blacksmith shop, horseshoeing shop, harness shop, and a bakery that produced 10,000 rations of bread a day. There was also a hotel and tavern called the Owens House, a post office, and a few small eating establishments. Camp Nelson had been built to support the Union Army's advance into Tennessee, and over its years of wartime service, tens of thousands of soldiers, both white and black, enlisted and were trained there. Camp Nelson was the largest of the eight U.S. Colored Troops (USCT) recruiting centers in Kentucky, and the third largest in the nation. All that remains aboveground, apart from the White House, though, are the remains of eight earthen and two stone forts, the earthen remains of a powder magazine, remnants of a few icehouses, and the stone foundations of two ovens.

A tintype photograph (far left) of Pvt. William Wright, an enslaved man who enlisted at Camp Nelson in Kentucky and was assigned to Company H, 114th U.S. Colored Infantry; an image (below) of a black family fleeing slavery by crossing Union lines taken shortly after the Emancipation Proclamation was issued; a printed broadside (below right) recruiting African Americans for military service was written by Frederick Douglass in Philadelphia.

During recent excavations in an area known from nineteenth-century maps to have been the camp's only licensed sutler's establishment, a type of general



MEN OF COLOR

TO ARMS! TO ARMS!

NOW OR NEVER

This is our golden moment! The Government of the United States calls for every Able-bodied Colored Man to enter the Army for the

Three Years' Service!

And join in Fighting the Battles of Liberty and the Union. A new era is open to us. For generations we have suffered under the horrors of slavery, outrage and wrong; our manhood has been denied, our citizenship blotted out, our souls seared and burned, our spirits cowed and crushed, and the hopes of the future of our race involved in doubt and darkness. But now our relations to the white race are changed. Now, therefore, is our most precious moment. Let us rush to arms!

FAIL NOW, & OUR RACE IS DOOMED

this the soil of our birth. We must now awake, arise, or be forever fallen. If we value liberty, if we wish to be free in this land, if we love our country, if we love our families, our children, our home, we must strike now while the country calls; we must rise up in the dignity of our manhood, and show by our own right arms that we are worthy to be freemen. Our enemies have made the country believe that we are cravens cowards, without soul, without manhood, without the spirit of soldiers. Shall we die with this stigma resting upon our graves? Shall we leave this inheritance of Shame to our Children? No! a thousand times NO! We WILL Rise! The alternative is upon us. Let us rather die freemen than live to be slaves. What is life without liberty? We say that we have manhood; now is the time to prove it. A nation or a people that cannot fight may be pitied, but cannot be respected. If we would be regarded men, if we would forever silence the tongue of Calumny, of Prejudice and Hate, let us Rise Now and Fly to Arms! We have seen what Valor and Heroism our Brothers displayed at Port Hudson and Milliken's Bend, though they are just from the galling, poisoning grasp of Slavery, they have startled the World by the most exalted heroism. If they have proved themselves heroes, cannot WE PROVE OURSELVES MEN?

ARE FREEMEN LESS BRAVE THAN SLAVES

More than a Million White Men have left Comfortable Homes and joined the armies of the Union to save their Country. Cannot we leave ease, and swell the Hosts of the Union, to save our liberties, vindicate our manhood, and deserve well of our Country. MEN OF COLOR! the Englishman, the Irishman, the Frenchman, the German, the American, have been called to assert their claim to freedom and a manly character, by an appeal to the sword. The day that has seen an enslaved race in arms has, in all history, seen their last trial. We now see that our last opportunity has come. If we are not lower in the scale of humanity than Englishmen, Irishmen, White Americans and other Races, we can show it now. Men of Color, Brothers and Fathers, we appeal to you, by all your concern for yourselves and your liberties, by all your regard for God and humanity, by all your desire for Citizenship and Equality before the law, by all your love for the Country, to stop at no subterfuge, listen to nothing that shall deter you from rallying for the Army. Come Forward, and at once Enroll your Names for the Three Years' Service. Strike now, and you are henceforth and forever Freemen!

E. D. Bassett,	Rev. J. Underdue,	P. J. Armstrong,	Rev. J. C. Gibbs,	Elijah J. Davis,
William D. Forten,	John W. Price,	J. W. Simpson,	Daniel George,	John P. Burr,
Frederick Douglass,	Augustus Dorsey,	Rev. J. H. Trusty,	Robert M. Adger,	Robert Jones,
Wm. Whipper,	Rev. Stephen Smith,	S. Morgan Smith,	Henry M. Cropper,	O. V. Catto,
D. D. Turner,	N. W. Depee,	William E. Gipson,	Rev. J. B. Reeve,	Thos. J. Dorsey,
Jas. McCrummell,	Dr. J. H. Wilson,	Rev. J. Boulden,	Rev. J. A. Williams,	I. D. Cliff,
A. S. Cassey,	J. W. Cassey,	Rev. J. Asher,	Rev. A. L. Stanford,	Jacob C. White,
A. M. Green,	James Needham,	Rev. Elisha Weaver,	Thomas J. Bowers,	Morris Hall,
J. W. Page,	Ebenezer Black,	David B. Bowser,	J. C. White, Jr.,	J. P. Johnson,
L. B. Seymour,	James R. Gordon,	Henry Minton,	Rev. J. P. Campbell,	Franklin Turner,
Rev. William T. Catto,	Samuel Stewart,	Daniel Colley,	Rev. W. J. Alston,	Jesse E. Glasgow.

A Meeting in furtherance of the above named object will be held

And will be Addressed by

U. S. Steam-Power Book and Job Printing Establishment, Ledger Buildings, Third and Chestnut Streets, Philadelphia.

store, Camp Nelson National Monument archaeologist Stephen McBride and a team from Transylvania University began to uncover picture frames, glass plates, mats, and glass bottles that originally contained chemicals used to develop photographs. They also found bottles embossed with the brand names "Bears Oil," which had once held hair oil, and "Dr D Jayne," which had once held hair dye. Soldiers used the dye to darken their hair for portraits, since light hair could appear white in the finished images, prematurely aging the subjects. In addition to these artifacts, the team also uncovered the remains of a small building—the first specialized photography studio ever found at a Civil War site. "The studio wasn't documented on any extant maps of the camp, and Civil War photos were often taken in tents," McBride says, "so finding something set up as a permanent photo studio was a real surprise." The team recovered 10 metal stencils the photographer had used to sign his images and was therefore able to identify him as a man named C.J. Young. (See "The Age of Pictures," page 42.)

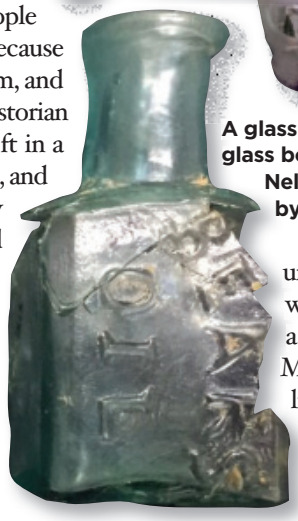
But Camp Nelson's population consisted of more than photographers, merchants, carpenters, blacksmiths, bakers, and soldiers. Many black volunteers arrived with their families, creating a huge influx of refugee women and children. "Camp Nelson is one of the best preserved archaeological sites associated with USCT recruitment," McBride says. "And it's also one of the best places to explore the refugee experiences of African American slaves seeking freedom during the Civil War." Through his work, McBride hopes to resurrect the too-often-lost stories of these women and children uprooted by the war that would determine their destiny.

Black military enlistees in Kentucky were in a treacherous position. Kentucky did not secede from the Union, but slavery remained legal, and the state's political leadership was vehemently opposed to the recruitment or enlistment of African Americans. They reasoned that a person could not be both a soldier and a slave. "The men could enlist with their owner's permission," McBride says, "but, as far as I know, not very many slave owners gave their permission." A rare exception was that of Pvt. William Wright, whose owner, John Russell of Franklin County, allowed him to enlist. Russell received a signing bonus of $300. "Even without permission, black men came anyway, and they were rejected and exposed to violence both coming and going," adds McBride.

On July 17, 1862, the U.S. Congress passed the Second Confiscation Act, which authorized the president to seize all property belonging to the Confederate states, including enslaved people. On the same day, the Militia Act was passed, empowering the president to use former slaves in any military capacity "for which he deemed them competent." The Emancipation Proclamation followed in September. "While originally President Abraham Lincoln's singular stated goal for the war was to preserve the Union, he walked a tightrope when it came to slavery," says historian Joseph Glatthaar of the University of North Carolina

An 1865 image of the Union Army encampment at Camp Nelson shows army vehicles, soldiers' barracks, and, in the distance, the White House, the only 19th-century structure still standing at the Camp Nelson National Monument site.

at Chapel Hill. "After the Proclamation, his goals shifted and he recognized the need to destroy the institution of slavery. This was the only way he saw to preserve the Union." According to the Emancipation Proclamation, all enslaved people in the "rebellious states" were freed as of January 1, 1863. This allowed recruitment of black soldiers to begin in earnest. As Union forces advanced deeper into Confederate territory, more and more fugitive slaves volunteered for military duty. "These people escaped from slavery and liberated themselves because they heard of the arrival of the army close to them, and they hoped for safe haven and protection," says historian James Downs of Connecticut College. "They left in a state of emergency, often under the cover of night, and made decisions in the middle of a major war." By the end of the Civil War, 178,975 free and freed black men had served in the Union Army in 175 USCT regiments, constituting about one-tenth of the army's manpower. The USCT also included Native Americans, Pacific Islanders, and Asian Americans. An additional 19,000 African American men served in the U.S. Navy, and more than 37,000 black soldiers died for the Union cause.



A glass bottle of "Dr D Jayne Liquid Hair Dye" (above) and a glass bottle of "Bears Oil" hair oil (left) were found in Camp Nelson's newly discovered photo studio. Both were used by soldiers preparing for their portraits.

Kentucky didn't allow black men to enlist until 1864, and historian Ann Murrell Taylor of the University of Kentucky explains that it was the state where emancipation proceeded most slowly. "The traditional notion of Lincoln striking down slavery with his pen is a fantasy," says Downs, "and slavery remained intact in Kentucky in any case, even after the war." Nevertheless, by the end of the Civil War, 23 regiments of men of color had been formed there, totaling some 23,500 soldiers. In May 1864, after the army removed the requirement for owners to give their permission, 250 men enlisted in the USCT at Camp Nelson in just one day.

"I wanted to learn about the day-to-day lives of these men," McBride says. "What possessions did they have that didn't fit army regulations? What weapons did they use? What did they eat?" During the course of his excavations, McBride has located not only mess houses for civilian employees that were well known from contemporaneous maps, but also poorly documented USCT housing. This includes evidence of huts, streets that had become refuse-filled drainage ditches, and a few cellars, as well as objects from soldiers' daily lives such as buttons; metal cups, plates, and pots; and some ceramic cups and plates as well. He has also found arms and ammunition that suggest the men used a wide variety of both up-to-date weapons and antiquated Model 1816 Springfield muskets.

On the basis of the animal bones and archaeobotanical evidence that has been unearthed, McBride says that what meat the USCT enlistees did eat consisted of relatively poor cuts of beef, such as ribs and hind shanks, supplemented with pork hams and hocks, and that they consumed a great deal of legumes, particularly beans, cowpeas, and lentils. For refreshment, they had whiskey, beer, and champagne, despite the fact that they were not officially permitted to drink. "Some of the most surprising artifacts we uncovered in the encampment were those associated with women and children, including colored glass beads, a brooch, a barrette, and porcelain doll fragments," says McBride. "This indicated that wives and children were living with their soldier husbands and fathers, which was strictly against army policy." The wives and children of soldiers are mentioned rarely, if ever, in records of the time, so these artifacts are some of the only evidence of Camp Nelson's shadow population.

In all, 5,700 African American soldiers enlisted at Camp Nelson and at least 5,000 more were trained there. Although the army discouraged the men from bringing their wives and children with them, the soldiers' families nonetheless continued to arrive. "I think that we underestimate these women's will to chart their own path to freedom," says historian Brandi Brimmer of Spelman College. "Black men's path is through military enlistment, even under the Confiscation Acts, but slave women's route is very different. They don't have a policy in place to support them and they have to find their own way."

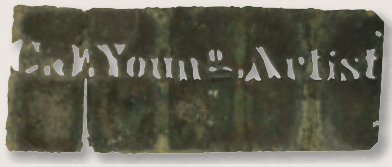
At first, most of the refugee families lived in huts and small cabins they hastily built themselves. They received no food rations or care. "The army really didn't know what to do with them," McBride says, "especially because, unlike their enlisted husbands and fathers, they were still technically enslaved." Even though the Union was not prepared to allow women and children into facilities like Camp Nelson, they went anyway, took up residence, and were often kicked out. Between June and November of 1864, on nine different occasions, according to Taylor, Camp Nelson's women and children were expelled. One of the most disastrous of these regular expulsions occurred in late November of 1864, when many women and children died of exposure and malnutrition during a particularly cold and windy month. "There is no bureaucracy to chronicle these people's illnesses, and their death is a direct result of their experiences as refugees," says Downs. "Their deaths, and those of others who died in the camp, were not recorded. They were anonymous, their lives and deaths not named."

A porcelain doll head (right), fragments (below) of everyday pottery, and a metal fork (bottom) found in the pre-expulsion camp were used by refugee women and children.

But families escaping slavery kept coming. "Black men made it clear they were not going to continue to enlist without a path to freedom for themselves and their families," says Brimmer. In December of 1864, the army began to build the Home for Colored Refugees at Camp Nelson. The status of African Americans was still very much in question as far as Union officials were concerned: Were the women and children legally attached to a soldier? What constituted a legal marriage between enslaved or formerly enslaved people? What about the aging women and men unfit to serve? Nevertheless, more than 3,000 people were allowed into the home during the last year of the war. "While it is true that the camp became more open to women and children," says Taylor, "and that there were new cottages, an opportunity for schooling and to go to church, and a chance to work and build a new life, the camp was still a significant source of turbulence, danger, violence, illness, and death."

While little archaeological evidence of the huts and cabins of the original women and children's camp remains, McBride has been able to reconstruct what the Home for Colored Refugees looked like through excavation, archival research, and by reviewing photographs. The Home consisted of four dormitories or wards, an office, a two-story school, 97 duplex cottages for nuclear families, and, when the cottages filled up, 60 tents supplied by the army. At the pre-expulsion site of the huts and cabins, McBride found a great deal of evidence of food preparation including

The Age of Pictures



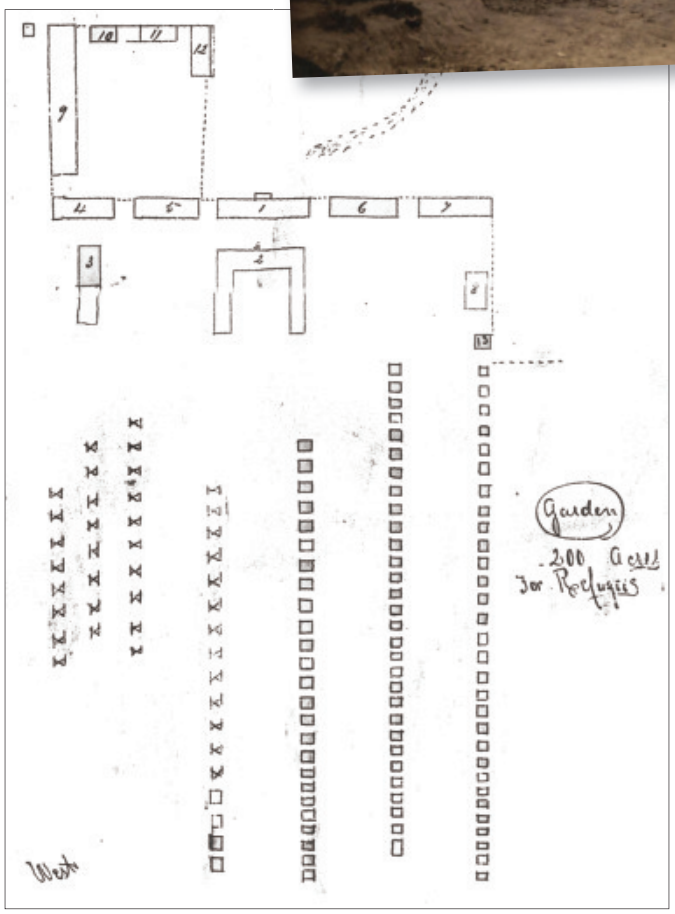
A frame and a brass plate with the name C.J. Young helped identify a recently uncovered building as Young's photo studio. A contemporaneous image of Young.

During the Civil War, soldiers were able to send pictures of themselves home for the first time in history. Therefore, it was not surprising to find that photographs were being taken at Camp Nelson. Prior to his recent excavations, Camp Nelson National Monument archaeologist Stephen McBride had found documentary evidence of at least four photographers working at the camp. One was G.W. Foster, who was contracted by the army and took photos to send with military reports to show how orderly the camp was.

The newly discovered photo studio has added Cassius Jones ("C.J.") Young, the son of a Lexington portrait painter, to the list of Camp Nelson's photographers. "The fact that we have so many photographers working at the camp really speaks to the prevalence and popularity of photography in the Civil War," McBride says. McBride identified Young's studio based on the brass stencils that he used to sign his work, most of which contained some kind of error and were likely discarded practice plates. His team also found brass sheets used to make stencils for soldiers' photos, which were marked with their name, unit, and company, as well as mats, glass plates, and chemicals for the developing process.

It was, of course, not only soldiers whose pictures were taken during the 1860s. "One of the most photographed people of the era was Frederick Douglass," says McBride. "Douglass wrote several articles on photography and called the era the 'Age of Pictures.' He thought that photography was an important social development because only people, not animals, could appreciate photographs. Soldiers and recently emancipated men were Americans, and they wanted to document their new status and to share it. A photo meant you were a person, and thus that African Americans were people, too." —*JAL*

A map sketched in 1865 (below) of Camp Nelson's Home for Colored Refugees and an 1865 photo (right) taken by G.W. Foster of residents of the Home's cottages. Thousands of refugees were housed there during the last year of the Civil War.



ceramics used for serving food, cast-iron kettles, and fragments of steel cooking utensils, as well as evidence of chimneys used for heating and cooking. He also uncovered evidence of food consumption—bones from poor-quality cuts of pork, medium- to poor-quality cuts of beef, chicken bones, and a small number of rabbit and fish bones, as well as liquor bottles. At the Home for Colored Refugees, however, the team found little to no evidence of either food preparation or consumption. Instead, there was a large mess hall where, explains McBride, the army strongly encouraged women and children to eat all their meals rather than cook for themselves.

McBride also uncovered some evidence of how women earned money to buy food and clothing. In the northwest section of the encampment, he unearthed fireplaces and a large concentration of cast-iron kettles and an iron, as well as a great number of both intact and broken buttons, seed beads, and hooks and eyes, all evidence of a laundry facility dating to before the November 1864 expulsion. "Especially early on, doing laundry was, along with cooking, one of the primary ways escaped slaves bartered or earned money for food," says McBride. "They didn't know what would happen to them, but they thought there was a chance of attaining freedom and had to adapt quickly to their situation." But, they were still enslaved.

On March 3, 1865, the wives, children, and mothers of USCT soldiers were finally emancipated by Congressional act. Five weeks later, General Robert E. Lee surrendered to General Ulysses S. Grant at Appomattox Court House in Virginia. For all intents and purposes, the Civil War was over. The USCT had played a crucial role, having been involved in 41 major battles and 449 skirmishes. "The black soldiers compensated for a lack of training with extraordinary valor," says Glatthaar. "In the face of assumptions that they would be cowardly, they could not afford to fail." For African American slaves, enlistment meant freedom for themselves, and, in some cases, their families. But, despite the Union victory, even after the war, their situation in Kentucky was nearly as difficult as it had been before and during it. "White Kentuckians did all they could to try to extend the system of slavery and to shut down the paid labor market for black men and women," says Taylor. After the war, Camp Nelson remained an important African American community even as its residents were still being kidnapped and enslaved. On December 6, 1865, the 13th Amendment was ratified, abolishing slavery throughout the United States. Nevertheless, in the 1870s, 7,000 African Americans would flee the state.

The impact of the USCT on the outcome of the war and the opportunity it provided for liberation cannot be overstated. On September 26, 1864, Elijah P. Marrs, a slave who had been born in January of 1840 in Shelby County, Kentucky, to a free man and an enslaved mother, enlisted in Lexington along with 27 other men. On their journey from their homes to the city, they carried with them 26 war clubs and one rusty pistol, and were accompanied by a Newfoundland dog for a spell. Marrs recalls in his memoir that he was immediately marched out onto Third Street to Taylor Barracks and mustered to Company L, Twelfth U. S. Colored Artillery, which was assigned to Camp Nelson. "This is better than slavery, though I do march in line to the tap of the drum," Marrs writes. "I felt freedom in my bones, and when I saw the American eagle, with outspread wings, upon the American flag, with the motto, 'E Pluribus Unum,' the thought came to me, 'Give me liberty or give me death.' Then all fear banished. I had quit thinking as a child and had commenced to think as a man." ■

Jarrett A. Lobell *is editor in chief at* Archaeology. ***For further reading, go to archaeology.org/furtherreading.***

Rock reliefs (below) that celebrated the construction of a canal during the Neo-Assyrian Empire (883–609 B.C.) were recently excavated at the site of Faida in Iraqi Kurdistan. A wall relief (right) from the palace of Sargon II (r. 721–705 B.C.) at Khorsabad depicts the king (far right) and his son and successor, Sennacherib (r. 704–681 B.C.).

THE KING'S CANAL

Rock reliefs in Iraqi Kurdistan show how Assyrian farmers toiled under the royal gaze

by Daniel Weiss

In ancient Mesopotamia, irrigation was the key to civilization. Rivers such as the Tigris and Euphrates carried a plentiful flow of water, fed by snowmelt from the mountains of Anatolia to the north. However, unlike the Nile in Egypt, which flooded on a regular annual schedule that perfectly accommodated the growing seasons, Mesopotamian rivers did so unpredictably and violently. To protect against the havoc caused by untamed flooding and to provide a steady supply of water to cultivate the land, Mesopotamian kings saw the construction of irrigation systems as among their chief responsibilities.

The pride rulers took in these engineering feats is made

clear by a number of celebratory rock reliefs that have been discovered near irrigation projects dating to the Neo-Assyrian Empire (883–609 B.C.). At the site of Khinis, for example, where the Gomel River emerges from a narrow gorge at the foot of the Zagros Mountains, the king Sennacherib (r. 704–681 B.C.) built a dam that diverted its waters into a canal that fed into a series of waterways snaking some 60 miles in all across the plains to the walls of his new capital at Nineveh. This canal was the crown jewel in an extensive regional irrigation network the king built. To commemorate his exploits, Sennacherib commissioned monumental reliefs, along with a lengthy cuneiform inscription, carved into a cliff rising above the canal head at Khinis. In the inscription, he claims that when he founded his new capital, its unwatered fields were "woven over with spider webs" and its people "did not know artificial irrigation, but had their eyes turned for rain (and) showers from the sky." Thanks to his new canal network, Sennacherib writes, opulent gardens bloomed at Nineveh, and the countryside grew abundant with crops.

Newly excavated Neo-Assyrian rock reliefs at the site of Faida, some 25 miles west of Khinis, also appear to enshrine the construction of a canal—though they do so in a way that archaeologists have never seen before. While no inscriptions have been found with the Faida reliefs, archaeologists believe they nevertheless conveyed a clear message to an audience that likely would not have been able to read inscriptions, even if they did exist. These were the local farmers who frequented the canal to draw water for their crops. And, unlike other known Neo-Assyrian reliefs associated with waterworks, which are confined to a single location, those at Faida stretch over at least a mile of the canal's length, blanketing the countryside. "We don't know anything that is really comparable with it," says Daniele

Morandi Bonacossi, an archaeologist at the University of Udine and codirector of the team working at the site. The reliefs offer insight into how Neo-Assyrian kings kept their subjects in line by trumpeting their accomplishments and boasting of their close ties to the deities who ruled over them all.

Uncovering the Faida reliefs was a long time coming. The site is located in Iraqi Kurdistan, which was off-limits to archaeologists for much of the twentieth century because of strife between its people and the government in Baghdad. During a brief visit to Faida in the early 1970s, British archaeologist Julian Reade spotted three sections of rock-cut reliefs poking out of soil that had washed down from nearby mountains, filling the canal. In 2012, Morandi Bonacossi led a survey of the waterway's four-mile length and identified six more relief sections cropping up from the ground. Only a foot or so at the top of the carvings was visible, revealing the tips of crowns that Morandi Bonacossi thought likely belonged to Assyrian deities. When ISIS advanced into the area, the archaeologists had to abandon their work. By late 2019, however, it was safe for Morandi Bonacossi to return with the Kurdish-Italian Faida Archaeological Project, along with his codirector, Hasan Ahmed Qasim of the Duhok Directorate of Antiquities.

In the process of excavating the previously known relief sections, the team discovered one more, for a total of 10. Each section measures about six feet high and 15 feet wide. As the archaeologists removed the soil from the carvings, they found that each panel depicted an identical scene in which statues of seven of the most important Assyrian deities are carried on the backs of animals—some real, some fantastical—while an Assyrian king stands at either end of the procession. The Assyrians saw these deities as immense in both physical form and in the power they wielded over humanity. Like humans, they were subject to emotions and capable by turns of compassion and cruelty. They were also amenable to prayers and hymns, but, as depicted in the Faida reliefs, the king shared a much more direct connection to them than did anyone else.

First in the reliefs' divine parade is Ashur, the chief Assyrian god. He was originally the local god of his namesake city, an early Assyrian capital, but grew in stature as the empire expanded. Ashur was considered the true ruler of Assyria, and the king his earthly representative. At the behest of the god, Neo-Assyrian kings led annual military campaigns to extend his—and their—territory, with some of their greatest gains occurring under Sennacherib and his father and predecessor, Sargon II (r. 721–705 B.C.). At the empire's height, the Assyrians controlled lands from western Iran to the Mediterranean and from Anatolia to Egypt. The kings moved huge numbers of people from one end of the empire to the other—in part to neutralize potential rebellions, and in part to populate new cities and provide farm labor in rural areas. Once they belonged to the empire, these new residents were expected to worship Ashur and the rest of the Assyrian pantheon.

In the carvings, Ashur stands far taller than the rest of the deities atop a bull and a *mušḫuššu*, a mythical Mesopotamian dragon that has the body of a snake, the front legs of a lion, and the rear feet of an eagle. Following Ashur is his wife, Mullissu, who sits on a decorated throne borne by a lion. Next in line is Sin, the moon god, supported by a horned lion. Then, propped up on a mušḫuššu is a deity Morandi Bonacossi believes to be the god of wisdom, Nabu, who gave people the gift of writing. After Nabu is the sun god, Shamash, who was also the god of justice—no earthly doings escape the notice of the sun. Shamash stands atop a horse; he was associated with horses because the sun disc was thought to be transported across the sky in a horse-drawn chariot. The weather god, Adad, who could bring gentle

Monumental reliefs that include a lengthy cuneiform inscription were carved on a cliff at the site of Khinis, 25 miles east of Faida, to commemorate a canal built there during the reign of Sennacherib.

rains or calamitous storms depending on his mood, is next, brandishing lightning bolts in his right hand and standing on a horned lion and a bull. Bulls were associated with the weather god because the Assyrians believed thunder was the sound of their stampeding hooves. Last among the deities is Ishtar, the goddess of love and war, wearing a star-topped crown and conveyed by a lion.

Morandi Bonacossi has identified the figure standing at each end of the procession as an Assyrian king, based on the cone-shaped tip of his tiara, the mace he holds in his left hand, and a hand-to-nose gesture used by royals to demonstrate respect to the gods. Although scholars have long believed that the Faida canal must have been part of Sennacherib's regional irrigation network, Morandi Bonacossi argues, in part based on stylistic features of the reliefs, that it was actually built by Sargon II. In the upcoming field season, he hopes to unearth further evidence to bolster his case. "Maybe we will find an inscription naming the king who built the canal and carved the reliefs," he says.

The Faida reliefs depict (left to right) the Assyrian moon god, Sin, standing on a horned lion; Mullissu, wife of the chief Assyrian god, Ashur, sitting on a decorated throne carried by a lion; Ashur, borne by a bull and a Mesopotamian dragon called a *mušḫuššu*; and an Assyrian king thought to be Sargon II.

THE CANAL AND RELIEF PANELS at Faida were all sculpted out of naturally occurring bedrock and ran along the side of a low hill. The plain below the canal is thought to have been home to a number of Neo-Assyrian villages inhabited largely by herders who tended sheep and goats and farmers who grew olives and grapes in the hills and wheat and barley on the plains. These farmers depended on the steady supply of water provided by the Faida canal and other irrigation projects in the area. Their crops were essential to feeding the appetites of residents of the nearby Assyrian capitals at Khorsabad, which was founded by Sargon II, and Nineveh. "These hydraulic systems allowed the Assyrian imperial administration to significantly increase the agricultural productivity of the area," says Morandi Bonacossi, "and it became a sort of granary for Assyria." The goal of the Faida reliefs, he points out, was to play up the king's privileged relationship to the gods, a relationship that allowed him to carry out such important irrigation projects. "The reliefs are telling the local people to remember that all this was made possible by the king," Morandi Bonacossi says, "and that he is the one to whom they owe the fertility of their land."

Jason Ur, a Harvard University landscape archaeologist who has studied Neo-Assyrian irrigation systems and rock monuments in the area, notes that most Neo-Assyrian reliefs were located in palaces or temples, which would have been accessible only to the elite, or at the edge of the empire, placed there as a warning to neighboring kingdoms. The Faida reliefs, by contrast, would have been seen by local farmers every time they came to the canal to open the sluice gates and water their fields. "This would have been a really powerful reminder to the 99 percent that the kings were there, they were divinely chosen, and they were powerful," says Ur. Given that the reliefs unearthed at Faida thus far extend over more than a mile of the canal's length, and that all 10 of them depict exactly the same tableau, Ur suggests they were intended to ensure that people living or farming at different points along the canal all received the same message: "You're living in Assyria and you're under the rule of the king of Assyria, who is the representative on Earth of these gods, and most importantly, of Ashur."

Many of these local residents, Ur says, may have been among those forcibly moved to the Assyrian heartland after having been conquered—a population that the king might have seen as in particular need of indoctrination into the Assyrian worldview. "It would have been important to convey these sorts of non-textual messages to people who may not have felt a cultural or ethnic connection to the land they found themselves in," says Ur. "Maybe they identified themselves as Israelites or Iranians or people from Anatolia." The origins of the population in the immediate vicinity of the canal are unknown, but at a site called Tell Gomel, some 30 miles to the southeast, Morandi Bonacossi has excavated a number of cremation burials—a non-Assyrian practice—interred with typical Neo-Assyrian grave goods. "This might suggest the presence of foreigners," he says, "of deportees who were captured during Assyrian military campaigns and resettled in Assyria." Once ensconced in their new homes, they were no doubt regularly informed that their well-being was now in the hands of Ashur, who had started out as the god of a single city and now presided, along with his able representative, the Assyrian king, over the largest empire the world had ever seen. ■

Daniel Weiss ***is a senior editor at*** **ARCHAEOLOGY.**

University of Wyoming archaeologist Richard Adams surveys remote terrain along the Continental Divide in the Wind River Mountains.

VILLAGES IN

High in the Rockies, archaeologists have discovered evidence of mountain life 4,000 years ago

By Matt Stirn

THE SKY

THE WIND RIVER RANGE in the Rocky Mountains stretches 100 miles across northwestern Wyoming and the Continental Divide, extending from the thick pine forests of Yellowstone National Park toward the vast grasslands of the Great Plains. From the river valleys and lakes below, the peaks of the mighty "Winds" rise toward the sky, reaching 13,000 feet above sea level. These granite towers pierce the clouds and are surrounded by high-altitude plateaus dotted with tundra and remnants of Ice Age glaciers. From a distance, they appear imposing, barren, and hostile, but closer inspection reveals a vibrant scene—herds of bighorn sheep traversing the horizon, marmots peeking up from boulder fields, and clusters of ancient whitebark pines standing watch over it all.

On the outskirts of a scraggly whitebark pine forest at 11,000 feet above sea level in the northern stretch of the range, a plume of smoke rises from a campfire as lunch is prepared in cast iron cookware over the open flames. Tents are spread out across the alpine meadow, and the whinnies of horses echo against nearby cliffs. It is a scene reminiscent of a nineteenth-century frontier camp, except for the presence of a bright yellow surveying instrument and the metallic ting of trowels as archaeologists scrape them against the pebbly soil. The site, known as High Rise Village, is perched on a hillside that would make a challenging black-diamond ski run. It was a large settlement occupied by the seminomadic Shoshone people from around 4,000 years ago until the nineteenth century. Discovered in 2006 by University of Wyoming archaeologist Richard Adams, High Rise Village was the first and largest of nearly two dozen high-elevation villages to be identified in the Wind River Mountains, and has provided new insight into how prehistoric people thrived in the high alpine zone of the Rocky Mountains.

Alpine archaeology is a relatively new field in North America. Conducting fieldwork in remote high-altitude areas is expensive and physically demanding. "Before the advent of modern, lightweight camping equipment, it often wasn't possible to run prolonged projects in the mountains," says Adams. As a result, the craggy peaks and wind-whipped ridges of the American West long remained a blank spot on the map of prehistoric North America.

In the 1960s, Colorado State University archaeologist Jim Benedict identified miles of stone walls along the plateaus of Colorado's Front Range, evidence of communal game drives constructed to corral large herds of bighorn sheep. Around two decades later, University of California, Davis, archaeologist Robert Bettinger discovered multiple alpine villages near 12,000 feet in California's White Mountains. Farther east, at 11,000 feet in Nevada's Toquima Range, David Hurst Thomas of the American Museum of Natural History found the Alta Toquima site, remains of a massive prehistoric village high in the alpine tundra consisting of dozens of depressions known as house pits. The discovery of such substantial sites in remote alpine settings was astonishing to many scholars across the western United States who had long considered the mountains too hostile for sustained human occupation. What led ancient people to build at such high elevations was an open question—did they actively choose to live in the alpine tundra, or were they forced there by factors such as population pressure or climate change? This question has fueled debate among alpine archaeologists worldwide, and each summer more researchers venture high into the mountains seeking answers.

IN THE FALL OF 1995, avocational archaeologist and hunting guide Tory Taylor tripped over a bowling ball–size blue rock while taking shelter under some trees during a thunderstorm in the northern Wind River Range. Turning it over, he recognized the object as a bowl that had been carved out of soapstone. Before this, no archaeological work had ever been attempted in the Winds. Several years later, the news of Taylor's find reached Adams, who was researching soapstone artifacts found throughout the Rocky Mountains. Adams contacted Taylor and, upon learning more about the discovery, planned a survey expedition with him to investigate the area.

In 2003, Adams, Taylor, and a group of volunteers hiked deep into the Wind River Mountains, with their equipment on horseback, for the first field season of what would become a project that is still going on 16 years later. During the initial surveys, the team recorded more than a dozen prehistoric sites above 10,000 feet. Scattered across the surface of the alpine tundra, the football field–size sites included tens of thousands of chert flakes, eroding hearths, hundreds of complete tools including scrapers, knives, and projectile points, and broken ceramic vessels and soapstone bowls. The size and number of sites discovered above the tree line indicated that hunter-gatherers had frequented the alpine terrain since the end of the Ice Age and that people had a much deeper history in the Wind River Range than had been previously realized.

While the large number of artifact-rich sites Adams discovered offered proof that ancient people had traveled in the Winds, questions remained about how the sites were actually used. Did they reflect occasional forays to higher elevations for hunting and foraging, or did they, as Adams speculated, suggest that people had established an enduring society in the mountains?

In 2003, when Adams investigated a wickiup, or wooden tepee, that had recently burned in a forest fire, he made

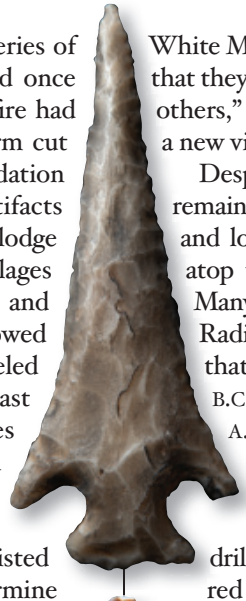
what he recalls as one of the most startling discoveries of his career. Where the small wooden structure had once stood amid thick grass and pine trees, the forest fire had revealed a lodge pad, a stone-lined circular platform cut out of the hillslope that had once served as the foundation for a wooden house structure. Thousands of artifacts were eroding out of it. Adams realized that the lodge pad resembled structures found in the alpine villages excavated by Bettinger in the White Mountains and Thomas in the Toquima Range. The discovery showed that prehistoric people hadn't just occasionally traveled in these mountains, but had actually built at least one semipermanent settlement. "Alpine villages were considered to be an exclusively Great Basin phenomenon," Adams says. "We were surprised to find that they likely existed in Wyoming, too." While the find established that alpine villages may have existed in the Winds, Adams needed more evidence to determine if they were common, or if the lodge pad found at the site of the burned wickiup was simply a fascinating anomaly.

In fall 2006, Adams was exploring a newly burned alpine forest with a team of volunteers. During a lunch break on the side of a steep slope dotted with granite boulders, Joyce Evans, an experienced avocational archaeologist, noticed a platter-size piece of sandstone that stood out against the surrounding rocks. Evans picked up the stone and realized that it was a heavily used grinding stone, or metate. It was clear evidence that prehistoric people had not only settled on this slope, but also had invested long periods of time there, as it would have taken several generations of grinding to make a rough sandstone so smooth and polished. Walking a few hundred feet from the rest of the team, Evans found a flat platform cut into the hillside that was full of chert flakes, and then another with a projectile point, and still more encircled by stone walls. Unbeknownst to them, Adams and his team had sat down for a rest in what turned out to be the largest alpine village yet discovered in the Rocky Mountains.

Over the next several years, Adams and his team mapped and excavated the new site, which they dubbed High Rise Village after the 300-foot distance between the settlement's lowest point and its highest, equivalent to a 30-story building. Their excavations revealed that the site was massive, with more than 60 lodge pads cut into the steep mountain slope. The discovery of such a large village took archaeologists aback. "Finding Alta Toquima and the White Mountain villages were such big surprises, we assumed that they were two of a kind and nobody was going to find any others," says Thomas. "So it was another large surprise when a new village appeared in the Wind River Range."

Despite the recent forest fire, the buried archaeological remains at High Rise Village, including the remains of tepee- and log cabin–shaped wooden wickiups that once stood atop the lodge pads, were exceptionally well-preserved. Many of the lodges also contained well-preserved hearths. Radiocarbon dating of charcoal from the hearths showed that people lived at High Rise Village as early as 2000 B.C., and that it was occupied continuously until about A.D. 1850. The artifacts the team recovered from the nine-foot-wide circular pads numbered in the tens of thousands, and included hundreds of chert and obsidian projectile points, as well as knives, scrapers, drills, bone needles, grinding stones, soapstone pendants, red ochre nodules, and broken ceramic vessels. The array of artifacts was typical of those made by the Mountain Shoshone people, also known as Sheepeaters after their affinity for hunting sheep. It's likely that a band of that tribe inhabited the village.

Adams and his team suggest that multigenerational families spent their time on the mountain hunting, foraging, processing pine nuts, and making and repairing a variety of tools. The excavations also indicated an intriguing level of social organization at the site, and that the village's seasonal inhabitants may have used different lodge pads for particular activities. The artifacts from one lodge, for example, consisted of stone tools used to make projectile points, whereas another lodge contained only artifacts associated with butchering meat and



These chert projectile points (top and center) were among those recovered from the site of a burned wickiup. At the same site (above), a circular area was identified by Adams and his team as the remains of a lodge built by Shoshone people.

An excavated lodge (left) at the site known as High Rise Village contained more than 10,000 artifacts and a hearth, visible in the center. Archaeologist Sarah Kennedy (right) sifts soil excavated from a lodge at High Rise Village in search of artifacts.

cleaning hides. A third contained only artifacts and flakes left from making bifaces, multipurpose stone tools used for cutting and scraping. "While we have only excavated a portion of the 60-plus lodges at High Rise, based on our current sample size it does appear that there was craft specialization or some division of labor at the site," says Adams. The team's discoveries suggest that the seminomadic inhabitants of High Rise Village had a complex social structure that they maintained even as they moved high into the mountains.

When not excavating at High Rise Village, Adams and his team ventured farther into the Wind River Range. They recorded nearly 100 prehistoric sites, identified quarries where soapstone was mined, and found four more, smaller, alpine villages. After years of working at High Rise Village, Adams became adept at spotting the faint remains of lodge pads. "I realized that the majority of lodge pads were informal and relatively difficult to recognize," Adams says. "There was a good chance that before High Rise, we had walked right through several villages." Adams returned to several previously identified sites, including the burned wickiup, and discovered that many were part of large prehistoric villages that had been overlooked. In addition to finding that alpine villages were much more prevalent than previously known, Adams and his team realized that the sites were all located in whitebark pine forests, on inclined sunny slopes, and at 10,500 to 11,000 feet above sea level. It was almost as if ancient people created one alpine village and replicated it atop other mountains throughout the northern Winds.

A Shoshone chert tool (right) and soapstone bowl fragment (far right) were found by Adams high in the Wind River Mountains. The holes were drilled in the soapstone fragment and sinew was used to bind it to a broken bowl.

Given the prevalence of grinding stones found at the sites and their location in whitebark pine stands, it appeared that the villages' earliest inhabitants chose their locations in order to harvest and process pine nuts, one of the fattiest food sources available to prehistoric people in Wyoming. To test this hypothesis, the team created a predictive model incorporating satellite, terrain, and environmental information over a large area to identify the best locations for people to harvest the nuts. The team then set out on horseback, toward the higher barren slopes of the Continental Divide, in search of the predicted sites. Using the model as a guide, they traversed turquoise glacial rivers, steered clear of grizzly bears, and navigated miles of alpine boulder fields. Ultimately, they identified 14 more prehistoric villages exactly where the model had predicted they would be.

Even after the team discovered that the alpine villages were so numerous, they still wondered why people would want to live long-term in such a severe environment as the Wind River Range when trout-filled lakes dotted the foothills and bison herds roamed the prairie below. Some scholars view high elevations as a difficult landscape where food was generally scarce,

unpredictable, and required a great deal of energy to acquire. This would suggest that ancient people may have chosen to build villages in the mountains to escape rising population pressure or prolonged droughts in the surrounding lowlands. "Because high-altitude archaeology is in an extreme environment, it acts as a barometer on the state of a wider human system," says University of Wyoming archaeologist Robert Kelly. He believes that the occupation of high-altitude villages waxed and waned depending on low-elevation conditions. "If there was a reduction in important resources at lower elevations," he says, "then groups might have expended the extra energy to acquire other resources from high elevations."

But other archaeologists, including Adams, believe the resources available in the mountains drew prehistoric people regardless of conditions in the valleys below, especially during certain seasons. Around mid-July in Wyoming, many low-altitude sources of water dry out, making it challenging for plants and animals to survive. The mountains during this time, however, teem with edible plants and herds of deer, elk, and bighorn sheep. For groups like the Shoshone, who were familiar with the seasonal growing cycles of plants and migration patterns of animals, the mountains would have offered bountiful opportunities for hunting and gathering throughout most of the summer. "I suspect that, as soon as the snow melted, people hiked into the mountains to harvest springtime root crops, then berries and tubers later in the summer, and whitebark pine nuts in the fall," says Adams. In his view, high elevations provided an environment that was no more difficult to survive in than the surrounding lowlands and required only a familiarity with the landscape.

Horses and pack mules carry the team's equipment and food to a base camp deep in the Wind River Mountains of Wyoming.

Whether the Mountain Shoshone were pushed or pulled into the mountains, the Wind River Range held great significance for them. The mountains played a central role in their mythology and remain important to their descendants today. "The Winds provide for our people in many ways—from the snow-capped peaks that provide us with water to the abundance of wild game, they have always given us what we need to survive," says linguist Lynette St. Clair, a member of the Eastern Shoshone Tribe. "We hold them in high regard, take only what will sustain us, and offer our prayers as an exchange." In the late 1800s, the remaining bands of Mountain Shoshone were moved out of the mountains and onto the nearby Wind River Reservation. As they assimilated into a larger and more diverse Shoshone community, many of their stories were lost. Adams and his team now hope that their work may help recover forgotten aspects of the mountain people's history.

One promising avenue of research is being pursued by environmental archaeologist Rebecca Sgouros of the nonprofit Paleocultural Research Group. By analyzing residues absorbed into artifacts, she and her colleagues hope to connect the archaeological record to Shoshone oral tradition. "We know that there were plenty of edible resources available to people in the mountains," Sgouros explains, "but what if we could know specifically what they were eating and what plants and animals were of special importance?" Sgouros has found residues on metates from the alpine villages that show that people used them to process pine nuts, animal fat, berries, and dried meat—the ingredients for pemmican, a traditional Native American food. Lipids extracted from pottery vessels also found in the alpine villages show evidence that they were used to cook elk, moose, and bear with chokecherries, biscuit-root, and leafy greens. Several soapstone vessels contained residues of pine nuts, chokecherries, rendered fat, and trout, a combination that matches the recipe for a Shoshone fish stew recorded in the early nineteenth century. "We are seeing evidence of foods that we know were historically important to the Shoshone," says Sgouros. "And we are getting to look beyond simple ingredients and actually get glimpses into cuisine and culture."

After 17 years of fieldwork, thousands of miles hiked, and hundreds of nights sleeping under the stars, Adams and his team still hope to better understand how people's relationship with the Wind River Range evolved over time and what daily life was like for those who chose to live in the high mountains. Once the spring snow melts and bighorn sheep begin to return to their summer range, the team will saddle their horses, triple-check the coffee supply, and venture once again onto the trail and into the towering peaks of the Winds. ■

Matt Stirn *is a journalist and photographer based in Jackson Hole, Wyoming, and Brookline, Massachusetts.*

To see more images of archaeology in Wyoming's Wind River Range, go to archaeology.org/wyoming

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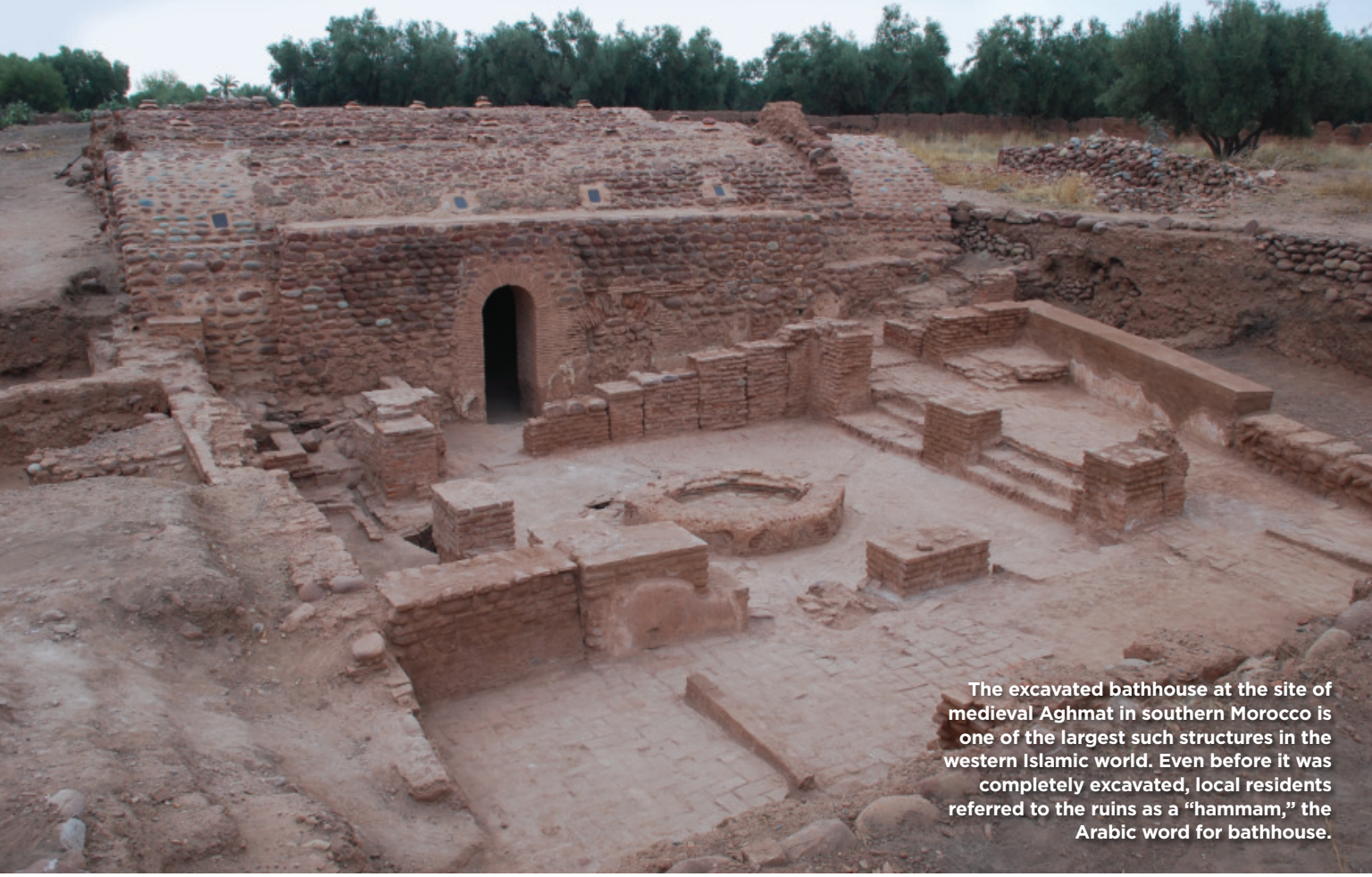

The excavated bathhouse at the site of medieval Aghmat in southern Morocco is one of the largest such structures in the western Islamic world. Even before it was completely excavated, local residents referred to the ruins as a "hammam," the Arabic word for bathhouse.

LETTER FROM MOROCCO

SPLENDOR AT THE EDGE OF THE SAHARA

Excavations of a bustling medieval city tell the tale of a powerful Berber dynasty

by Sara Toth Stub

Fifteen years ago, retired archaeologist Ronald Messier, who had spent much of his career excavating the site of Sijilmasa on the northern edge of the Sahara, got a phone call from Frederick Vreeland, a former American ambassador to Morocco and the son of the fashion editor and columnist Diana Vreeland. Vreeland, who was also retired and lived on an estate just south of the bustling city of Marrakech, asked Messier to come and take a look at some nearby ruins that locals called the hammam, the Arabic word for bathhouse. Vreeland was concerned that something important might be slipping away from decay and neglect at the dilapidated site next to a slaughterhouse on the outskirts of the modern village of Ghmat.

Messier visited the site a few days later, and, after just a few minutes of inspecting the tops of three well-worn stone and brick domes poking out of the red soil amid the trash, was convinced it was, indeed, important. "I could tell from the pottery sherds scattered about that the remains went back to the Middle Ages," says Messier, a professor emeritus at Middle Tennessee State University. "I knew that this was likely the ruins of medieval Aghmat." The location of Aghmat, which is partially encircled by the foothills of the High Atlas Mountains, was not a mystery. From the ninth through fourteenth centuries, the city was a key trans-Saharan trading hub. It is well-known from contemporaneous texts and is even noted on a few modern maps. But while many travelers over the centuries had sketched the

ruins, and the site was partially surveyed by French archaeologists in the 1990s, it had never been excavated.

Messier soon abandoned his retirement plans, and along with Abdallah Fili of Chouaib Doukkali University and Chloé Capel of the University of Paris, began excavating Aghmat in earnest. Thus far, the team has uncovered the large bathhouse whose domes Messier saw during his initial visit, along with a palace and mosque, residential villas, remains of water systems, parts of the ancient city walls, and thousands of artifacts. The rest of ancient Aghmat, which may once have extended over three-fourths of a square mile, still lies buried under the homes and farms of Ghmat. "This site has undeniable scientific value," Capel says. "It's an almost unique source of knowledge about medieval urban societies in North Africa, of which we know little."

Until recently there had been relatively little scholarly interest in medieval archaeology in Morocco, says Fili, who also directs excavations at Igiliz, another recently identified medieval settlement in the Atlas Mountains. In the past, the country's prehistoric and Roman-era remains have taken precedence in both funding and government conservation policies. The lack of a datable local ceramic record for the Middle Ages, an important time of transition when Islam and Arabic culture arrived and took root in Morocco, also makes study of the period difficult, Fili explains. Now, improved training and stricter cultural preservation laws have led to a growing number of medieval archaeology projects.

Excavations by Messier's team provide a rare opportunity to examine the history of the Berbers, the descendants of the pre-Arab inhabitants of North Africa, some of whom made Aghmat their home. Amid the Arabs' expanding power in the region during the Middle Ages, some of the indigenous Berbers forged an ever-shifting system of alliances. Despite coming from dozens of different tribes, many of which had their own languages and cultures, the Berbers created dynasties that ruled much of North Africa and Spain from the eleventh to sixteenth centuries. The Berbers lived in the mountains and the desert and were often nomadic. Thus, they were intimately familiar with the region's topography. They derived much of the power and influence that later allowed them to form these dynasties by controlling sections of the important trade networks that crossed the harsh terrain of North Africa to reach Europe and the Mediterranean world.

But the Berbers, even to this day, have never been one political or cultural entity. In addition to the fact that tribes speak

Glazed ceramic objects found at Aghmat were likely made locally, indicating the presence of a resident artisan population skilled in the *cuerda seca* glazing technique that was often used in Spain.

The excavation team at Aghmat uncovers decorative carved medieval stucco.

different, although closely related, languages of the Afroasiatic family, they have also embraced a diversity of religions, including the worship of solar and lunar gods, Judaism, Christianity, and Islam. Today, Berbers and people with at least some Berber ancestry still make up a large part of the population of Morocco, as well as neighboring Algeria. Although many Berbers are part of modern urban society in Morocco, there are regions, including the green valley and mountains around Aghmat, where some Berber tribes still pursue a traditional rural lifestyle, building homes from local red clay and raising goats or weaving baskets for a living.

In the seventh century, descendants of the prophet Muhammad, who had founded Islam earlier that century on the Arabian Peninsula, established the Umayyad Caliphate. In 680, the Damascus-based dynasty invaded Morocco in an effort to expand its growing empire. From there, the Umayyads, with the Berbers' help, conquered southern Spain and established the Arab territory of al-Andalus. Although the Berbers in Morocco adopted Islam, they successfully revolted against Umayyad rule in 740, angry about what they saw as unfair taxation practices and the caliphate's favoritism toward Arabs over other ethnic groups. As a result, much of the western part of North Africa was ruled once again by independent tribes. Despite the expulsion of the Umayyads, Islam and the Arabic language and culture persisted in Morocco and among the Berbers, who went on much later to found the first Moroccan non-Arab Islamic dynasty, the Almoravids. By the time the Almoravids came to power in the eleventh century, Aghmat, then ruled by another Berber tribe, was "the most important city in southern Morocco," Messier says, and the Almoravids declared this thriving urban center their first capital.

The earliest record of the name Aghmat appears on a silver coin identifying the city as the place where it was minted in 814 by the Idrisid Dynasty, Morocco's first homegrown Islamic monarchy. The dynasty was founded in 789 by Idris I, a descendant of the prophet Muhammad who fled to Morocco after leading a failed

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A once-domed 10th-century reception hall with an octagon-shaped pool at the center was part of the hammam in Aghmat.

rebellion in the Arabian Peninsula against the Abbasid Caliphate, another branch of Muhammad's extended family that succeeded the Umayyads and ruled much of the Middle East at the time. Upon coming to North Africa, Idris married a Berber woman from the Awraba tribe, and became a leader among the indigenous people. He founded Fez, a trading post on the banks of the Jawhar River in northern Morocco that would later attract an influx of Arabic-speaking migrants from Spain and become a great economic and cultural center. From this well-placed settlement, the Idrisids went on to control a large part of what is now Algeria and Morocco. This sparked the ire of the Abbasid caliph Harun al-Rashid, who sent emissaries who poisoned Idris in 791. Idris' son, Idris II, took power and ruled Algeria and Morocco, focusing his attention on the fertile areas north of the Sahara, including Aghmat. Until this point, Aghmat had been a simple agricultural settlement, but it was perfectly positioned to take advantage of the trans-Saharan trade, a growing network of camel caravans carrying salt, gold, and slaves between Europe, Africa, and the Middle East.

The first known textual reference to Aghmat appears in the writings of the ninth-century geographer Ahmad al-Yaqubi, who described it as a fertile region around the Ourika River, whose waters made the region suitable for farming. In 977, the Arab geographer Ibn Hawqal described Aghmat as a place of "merchandise going out and coming in," and listed it among other important cities, including Fez. "Trade passing through places like Aghmat was central to the global economy," says Kathleen Bickford Berzock, associate director of curatorial affairs at Northwestern University's Block Museum. In addition to goods, Berzock says, trade also moved ideas, spreading Islam as well as artistic and architectural styles. It also united disparate geographic regions and different cultures. After Idris II's death, the Idrisid Dynasty split into several self-ruling states, each headed by descendants of the caliph, who were fully integrated by marriage into Berber society. Aghmat was part of one of these states, ruled by the local Zenata Berbers, who had been one of the first tribes to adopt Islam and an early ally of the Idrisids. According to the writings of eleventh-century historian al-Bakri, the city had a population wealthy enough to slaughter 100 cattle and 1,000 sheep for its weekly market. It also minted its own gold coins.

During the mid-eleventh century, farther south across the Atlas Mountains in the western Sahara, Yahya Ibn Ibrahim, the leader of the Sanhaja confederation of Berber tribes, long rivals of the Zenata Berbers, returned from a pilgrimage to Mecca with a desire to foster the devout practice of Islam among his tribes, who had learned what little they knew of the religion from passing caravan traders. Ibn Ibrahim enlisted the help of a devout man, Abdallah Ibn Yasin, from another tribe in his confederation, to help further unite the various groups—all with his eye on gaining control of the lucrative trans-Saharan trade. This confederation became the Almoravid Dynasty (1040–1147), whose name means "bound together in the cause of God." Beginning in 1054, the Almoravids expanded their territory, eventually conquering places like Sijilmasa and Koumbi Saleh in neighboring Mauritania, a large city of the Ghana Empire where Capel has led an archaeological project. In 1058, the Almoravids defeated the Zenatas, took control of Aghmat, and declared it their capital.

When the Almoravids reached Aghmat in the eleventh century, it was already a highly developed and prosperous city. Excavations by Messier's team have shown that a century earlier, its residents had built the large three-chambered hammam on the model of Roman bath

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complexes, with a cold room, a tepid room, and a hot room, a style seen widely in North Africa and southern Spain during the period. A domed reception room with an octagonal pool in the center would have welcomed visitors to the complex, which also had toilets and rooms for dressing. Although the dome over the reception room no longer stands today, the three main vaults remain largely intact. Under these vaults, archaeologists have uncovered parts of stone flooring and walls still covered in white lime plaster, as well as arched doorways with decorative brickwork connecting the rooms. According to Messier, this is the largest medieval hammam found in Morocco, and one of the biggest in the western Islamic world.

The team has also excavated a large palace complex and unearthed the remains of walls once decorated with floral designs carved in stucco and found a great deal of glazed *cuerda seca* pottery, a colorful style associated with the Andalusia region of southern Spain. Scholars have assumed that such pottery was imported to North Africa, where it has been uncovered at numerous archaeological sites, including Fez and Sijilmasa. But at Aghmat they discovered the first indications that cuerda seca pottery was also made locally. Although the team has yet to find the facilities where it was manufactured, Messier believes that the number of defective and incomplete pieces found at the site supports this interpretation. "You would not have imported unfinished and flawed pieces," he says. Messier thinks that the quality of the pottery is evidence that the city likely had a large class of resident craftspeople in addition to the merchants who plied the trans-Saharan trade routes.

Aghmat's palace was likely the home of the city's most famous resident, Zaynab an-Nafzawiyya, the daughter of a successful merchant from Tunisia who settled there. Zaynab, who was married to three different rulers of the city, including two Almoravid governors, is one of the most prominent women in Islamic medieval history. "This woman was distinguished by her beauty and wealth," writes the twelfth-century historian and mayor of Fez, Ibn Idhari. "She had praiseworthy virtues and an

(continued on page 62)

The remains of the palace suggest that people lived in Aghmat after its economic importance declined with the rise of nearby Marrakech.

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original mind." Ibn Idhari is one of several Arabic sources who portray Zaynab as an Almoravid hero and credit her with the empire's success in conquering parts of North Africa and Spain, including the lucrative gold trade routes. Although Zaynab stands out, her high standing was not so rare, explains historian Fatima Rhorchi of Moulay Ismail University. "We know from texts that elite women were involved in politics and promoting culture during the Almoravid Dynasty," Rhorchi says. "Zaynab is one example of the level of emancipation that women had, at least those who belonged to the ruling classes."

Near the palace, the team excavated a mosque, the remains of which consist largely of bases of pillars and parts of the mihrab, or prayer niche, and fragments of building material decorated with verses from the Koran and floral and geometric stucco designs similar to those found in the palace. Messier suspected at first that the rest of the mosque's pillars had likely been carted off for reuse elsewhere. However, in 2014, a local construction crew installing new streetlight posts needed to dig up the modern road that runs through the site. There, Messier's team found a wall of the mosque, and the remains of four pillars arranged at the corners of a square. Decorative tiles covered the floor, in the center of which the team identified the broken remains of a black flower-shaped stone basin, which had likely been used for ritual washing before prayers. This basin is referred to in the writings of Ibn al-Khatib, a historian from Granada, Spain, who visited Aghmat in 1360. He describes it as well-worn, implying it had been used for centuries before he saw it, likely stretching back to the days when the Almoravids occupied the city. "This discovery has deeply moved us all, not particularly because of the exceptional nature of this piece, but more precisely because this object is probably the only object in Aghmat that the texts speak of," Capel says. "It's really unusual to have textual evidence overlapping archaeological evidence. It was also very moving to feel life here, to feel human beings living in this place more than six hundred years after their society is gone."

A fragment of stucco unearthed at Aghmat, carved and painted with a geometric pattern, is similar to that which decorated its palace and mosque.

Further evidence of the mosque's former grandeur was provided by a set of stone tracks carved in the floor that would have been used to roll the *minbar*—a large, usually wooden, pulpit from which the imam preached on Fridays—from the closet where it was traditionally kept during the week.

How much of Aghmat the Almoravids built is not yet clear. Capel says it's possible that they constructed some new buildings, including the palace complex, as a way to differentiate themselves from previous residents and rulers, and to assert their power. However, just over a decade after they conquered the city,

A colored mosaic found in one of Aghmat's upscale residential villas is evidence of the wealth of some of the city's residents.

the Almoravids decided they needed a new capital. Messier thinks that, having hailed from the desert, they never felt safe in Aghmat, surrounded as they were on three sides by the foothills of the Atlas Mountains. In 1062, the Almoravids traveled 18 miles north, set up tents on a plain, and began constructing their new capital city of Marrakech. "Those 18 miles are flat as a pancake, so they could see an enemy coming," Messier says. A few surviving remnants from the early days of Marrakech, including a highly decorated wooden minbar and a domed ablutions hall whose stone ceiling is etched with geometric designs, indicate the high level of craftsmanship the Almoravids marshalled in building their new city. The similarities between a washing basin found in Marrakech and the one found in Aghmat suggest to Messier that the Almoravids may have drawn on the older city as inspiration. "Aghmat is the precursor of Marrakech," he says.

Gold dinars minted by rulers of the Almoravid Dynasty in Aghmat in A.D. 1111 are a sign of the city's wealth and standing in the region.

Messier hopes to find other examples of how the old city influenced the new, but unlike Aghmat, Marrakech is a heavily built-up urban center of pink clay buildings, magnificent palaces, towering mosques, and winding alleyways of markets, and hence is difficult to excavate.

With the rise of Marrakech, which became a major stopping point for trans-Saharan caravans, Aghmat began to decline in economic importance, although the Almoravid royal family continued to live there. Yet even Marrakech's sturdy walls and its location on the plain did not prevent the Almohads, another group of Berbers from the Atlas Mountains, from attacking Marrakech in 1147. This brought an end to the Almoravid Dynasty. Aghmat, however, endured

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for at least another 200 years. In 1154, the geographer al-Idrisi wrote that the people of Aghmat were "opulent, wealthy merchants who go into the land of Sudan with numbers of camels bearing immense sums," and that there were "none richer."

Messier's team has found luxurious villas containing reflecting pools and intricate blue, grey, and white mosaic tile floors dating from this time. There are indications that these homes were maintained, and even renovated, through at least the late fourteenth century. But both the archaeological evidence and textual sources indicate that Aghmat, which had been an economic and cultural hub for 500 years, eventually became a rural settlement once again. The palace was emptied and its doors sealed in the late fourteenth century, and the hammam fell out of use. In the hammam, Messier has found trays for drying clay along with misfired clay objects, suggesting that much of the bathhouse's space was converted to pottery workshops. The fifteenth-century Spanish traveler Luis del Marmol Carvajal writes that when he visited Aghmat, the once-opulent villas were occupied by Sufi mystics who spent their days working in their gardens, making simple pottery, and gathering at the mosque.

Fountains and decorative pools were found among the residential villas and palace complex in Aghmat, a further indication of the city's opulence.

Today, the village of Ghmat is home to many traditional Berbers. They hold a large market every Friday where farmers sell live animals and produce, and where people from other Berber towns in the region arrive by bus, car, and donkey. People here still speak Tamazight, an endangered Berber language that the Moroccan government has officially recognized amid a resurgence of Berber identity. Aside from the ruins, another hint of the Berbers' role in Aghmat's storied past can be found at a domed mausoleum, renowned as the burial place of Muhammad Ibn Abbad al-Mu'tamid, a famous Arab poet and king of Seville in al-Andalus whom the Almoravids imprisoned in Aghmat after they conquered his former kingdom. This building reminds people that what looks like a simple village once attracted the region's most powerful leaders and most influential intellectuals, both enemies and friends. ■

Sara Toth Stub *is a writer living in Jerusalem.*

CELEBRATING TEN YEARS OF INTERNATIONAL ARCHAEOLOGY DAY

On October 17, 2020, we'll celebrate the 10th anniversary of International Archaeology Day (IAD). Over the last decade, IAD has become one of the AIA's largest outreach efforts: more than a million people have participated in over 5,000 IAD events in 45 countries. The program's success is a testament to the popularity of archaeology and archaeological activities across the world. We would like to thank all our collaborating organizations and individuals who have sponsored our efforts over the years, including the U.S. National Park Service, Nationwide, NOAA, former AIA Trustee Douglas Tilden, and everyone who has organized or attended an event, for making IAD's success possible.

IAD's primary goals have remained unchanged—to celebrate archaeology and archaeological discoveries and achievements;

to highlight the organizations and people who are committed to preserving, protecting, and presenting the past; and to emphasize the idea that archaeology is everywhere and everyone can get involved. The first Archaeology Day featured 14 collaborating organizations in the United States, Canada, and the United Kingdom, and 80 AIA local societies participated. These groups hosted 115 events attended by about 15,000 people. In 2019, IAD boasted over 500 collaborating organizations, from large national and international organizations to small local libraries and historical societies, and more than 1,200 events attended by 250,000 people in 25 countries.

We invite you to join us throughout the month of October 2020 to celebrate the 10th year of IAD. Become a collaborating organization by hosting an IAD event, or celebrate archaeology by attending one. Archaeology fairs, museum and site tours, and online activities are just a few of the engaging outreach events and programs hosted by collaborating organizations. If you represent a collaborating organization, remember to list your event on the IAD calendar and blog about it on the AIA's IAD website. Share information about your local IAD events using the official hashtags **#IAD2020** and **#InternationalArchaeologyDay** and make sure to tag the AIA at **@archaeology_aia** on Twitter and Instagram or **@Archaeological.Institute** on Facebook. Learn more at archaeologyday.org.

AIA SUPPORTS SITE PRESERVATION AT DEIR EL-BALLAS, EGYPT

The 2019 AIA Site Preservation Grant will fund work at the Egyptian site of Deir el-Ballas undertaken by the Ancient Egyptian Heritage and Archaeology Fund and the American University in Cairo (AUC). Deir el-Ballas was a capital of the Theban kings at the end of the Middle Kingdom (2030–1640 B.C.) and served as a military base for the Thebans during their war against the Hyksos. The site includes the remains of two palaces, a workers' village, an administrative quarter, and a number of private houses.

Unfortunately, despite its archaeological and historic importance, Deir el-Ballas is at risk from looting and from the expansion of the modern town of Deir el-Gharbi. Illicit digging has undermined a number of the standing monuments and caused a collapse of a large portion of the South Palace's facade. The North Palace, located between the modern town and its graveyard, has been used as a trash dump. Parts of the ancient settlement were bulldozed for the construction of new housing, cemeteries, and the local pottery industry. The impact of modern development has been exacerbated by the construction of the Western Desert Road from Aswan to Cairo.

The AIA-supported project will address the damage that has been done to the site, develop a long-term site protection plan

in conjunction with the state antiquities service, and engage the local population in preservation efforts. Preservation work will include stabilizing parts of the South Palace, rebuilding the top of a wall with modern unbaked mudbrick, preserving a stair platform that leads to the top of the building's eastern facade, continuing the removal of modern trash from the North Palace, filling in the North Palace's emptied casemate foundations with clean sand, and replacing fallen and eroded mudbrick with modern materials that conform to the original.

Led by Egyptologist Peter Lacovara, project members will work with the antiquities service in Qena to create a site management plan that includes the installation of signage in Arabic and English, a wall that will clearly demarcate the area of the ancient site from the surrounding desert, and efforts to promote an understanding of the significance of the site to the local community. Planned outreach and education efforts include working with AUC's education department to develop lesson plans that will integrate information about the site and its role in Egyptian history into the existing curriculum at Deir el-Gharbi's secondary school and the development of an adult education program for residents of the village. In addition, project members have commissioned a play about Queen Ahhotep and the Hyksos expulsion centered on the site that will be performed at the restored North Palace by members of AUC's theater program.

The AIA is excited to support this effort. To read more about the Site Preservation Program, please visit archaeological.org/site-preservation. You can make a donation to support our efforts at archaeological.org/site-preservation/donate. All AIA programs are made possible by generous donors and AIA members.

2021 ANNUAL MEETING

It's never too early to start planning for the next annual meeting. The 122nd Joint Annual Meeting of the AIA and the Society for Classical Studies will take place in Chicago from January 7 to 10, 2021. For further details, please go to archaeological.org/annualmeeting.

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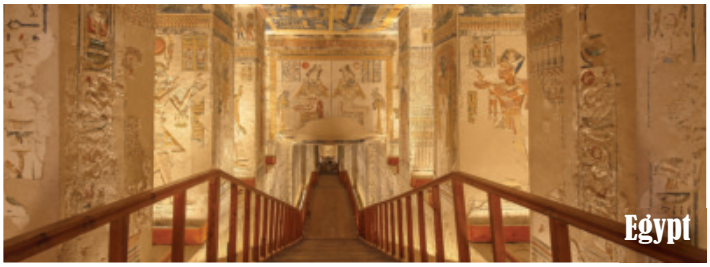

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Jews first settled in the Polish town of Wieliczka during the fourteenth century, when they were granted the right to extract salt from the vast local mine. A Jewish population continued to live in the town until August 27, 1942, when 8,000 Jews were deported by the Nazis to death, labor, and concentration camps across the country. Yet, despite the Nazis' determination to annihilate it, evidence of this thriving Jewish community survived in the city's Old Synagogue. There, archaeologist Michał Wojenka of Jagiellonian University's Institute of Archaeology recently unearthed the remains of a wooden box filled with 350 artifacts, including silver cups and candlesticks, brass chandeliers, and this Torah shield and pointer.

At first Wojenka thought that the hoard dated to World War II. But army officers' badges he found among the treasures suggest that the box was likely actually buried during World War I, when this area of Poland was part of the Austro-Hungarian Empire. In 1914, the advancing Russians drew close to the town. "We know that elsewhere some Russians confiscated metal objects," Wojenka says. "Maybe Wieliczka's Jews feared this, and buried the synagogue's inventory." This might also explain the presence of the Austro-Hungarian army officers' badges. "They knew the Russians were right around the corner and may have decided to get rid of their officers' distinctions," he adds. Regardless of precisely when the hoard was buried, discovering it has had a profound impact on Wojenka. "It was extremely emotional for me," he says. "It was like bringing to light a piece of the shared past of both Jews and non-Jews in Poland. I think that awareness and memory of this past is something that present-day inhabitants of Poland owe the Jewish community. Poland was our common home."

WHAT IS IT
Torah shield and pointer

CULTURE
Jewish

DATE
First decade of the 20th century

MATERIAL
Silver

FOUND

DIMENSIONS
6.89 by 8.66 inches

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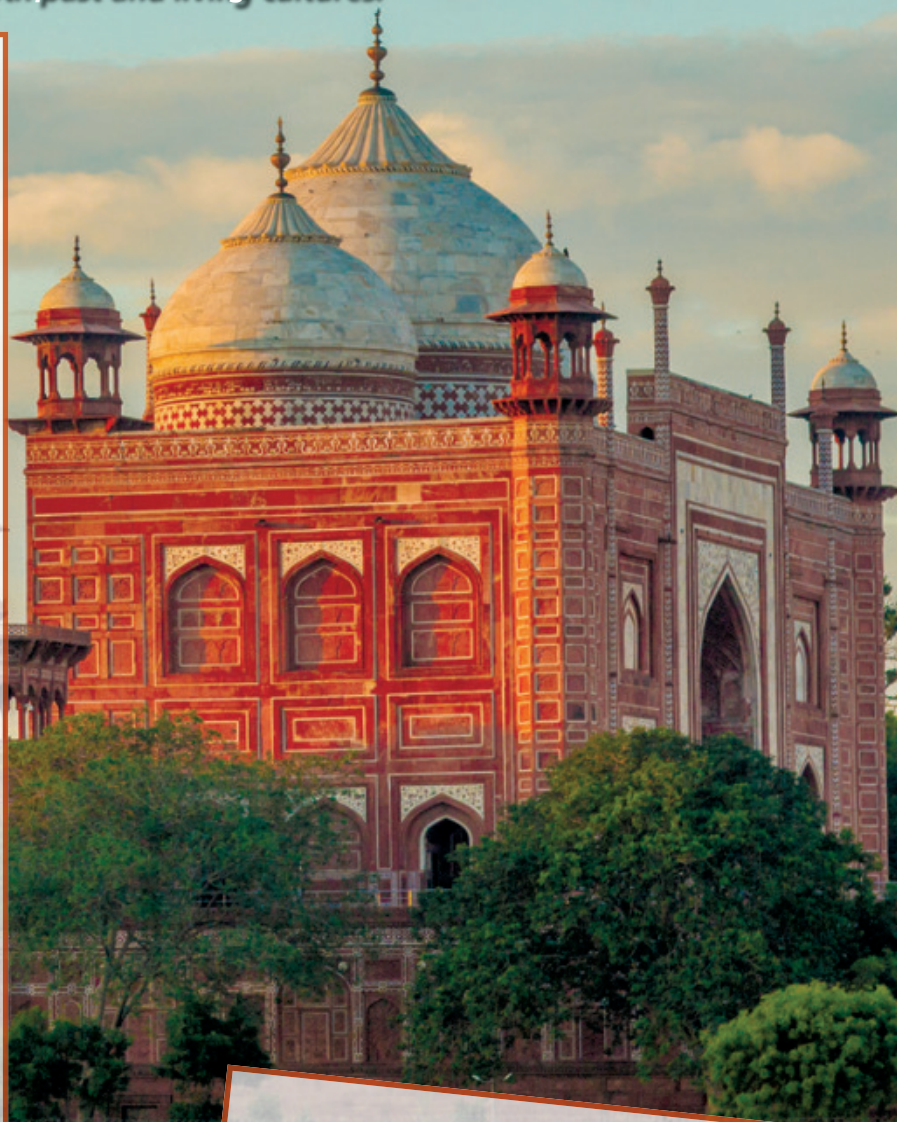

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